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THE FOURTEENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

PART I

MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS—STANDARDS AND CURRENT PRACTICES

THIS YEARBOOK WAS DISCUSSED AT THE CINCINNATI MEETING OF THE NATIONAL SOCIETY, FEBRUARY 22, 1915, AND AT THE CINCINNATI MEETING OF THE DEPARTMENT OF SUPERINTENDENCE OF THE NATIONAL EDUCATION ASSOCIATION

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BY

H. B. WILSON, H. W. HOLMES, F. E. THOMPSON, R. G. JONES, S. A. COURTIS, W. S. GRAY, F. N. FREEMAN, H. C. PRYOR, J. F. HOSIC, W. A. JESSUP, W. C. BAGLEY

Edited by S. CHESTER PARKER, *Secretary*

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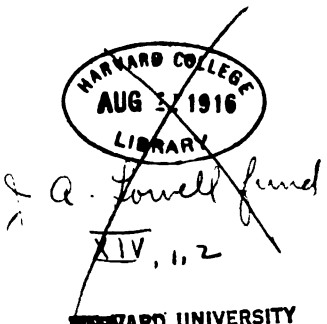

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This Yearbook is the 1915 report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education.

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PREFACE

This volume continues the policy that has characterized the publication of Yearbooks in recent years by the National Society for the Study of Education, namely, to present discussions that deal directly with the practical problems of readjustment that now confront American educators, and to include descriptions and suggestions that will prove of direct practical value to teachers and administrators in solving these problems in their own schools.

At the meeting of the Department of Superintendence of the National Education Association in Richmond, Virginia, in February, 1914, the Committee on Economy of Time from this organization presented a report and was continued for another year. Members of this committee who were also members of the National Society for the Study of Education, and who were familiar with the policy of the latter organization in publishing Yearbooks *before* the meeting at which they were to be discussed, suggested the possibility of the National Society's publishing the 1915 report of the committee in this way. This plan was adopted and carried out. The present volume is the result.

PART I

INTRODUCTION

CHAPTER I

THE MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS

REPORT OF THE COMMITTEE ON ECONOMY OF TIME

H. B. WILSON, *Chairman*
Superintendent of Schools, Topeka, Kansas

This report to the National Department of Superintendence by its committee on Economy of Time in Elementary and Secondary Education, made with the assistance of a number of co-operating investigators, constitutes the fourth large effort within the last two decades by some branch of the National Education Association to examine and improve the curriculum of the public schools. Attention was first directed to the high-school curriculum in the report of the Committee of Ten. The report of the Committee of Fifteen was concerned with the training of teachers and the organization of city schools, but it also gave large attention to the correlation of the studies of the elementary schools. The report of the Committee of Twelve on Rural Schools, in its treatment of instruction and discipline, discussed the course of study, accepting the report of the Committee of Fifteen on the several branches of the course of study.

The present report on the minimum essentials in certain subjects of the elementary curriculum is one result of an effort to develop a program for economizing time in public-school education. The attack on this large problem was begun in the National Council of Education in 1903 under the leadership of President Emeritus James H. Baker.[1] The

[1] The chief initial impetus toward the movement for economizing time in education, probably antedating somewhat the attack on the problem by the National Council, was given by the late President William R. Harper, of the University of Chicago, before a notable gathering at the University in the autumn of 1902, where he read a brief paper proposing a scheme for saving two years of time in the completion of a college course. Participating in this discussion were the late Superintendent Louis Soldan, of St. Louis, and Professor John Dewey. See "Shortening the Years of Elementary Schooling," by John Dewey, *School Review*, II, 17, January, 1903.

most significant result thus far of the work of the Committee from the Council is the report on "Economy of Time in Education," published in 1913 as *Bulletin 38* of the Bureau of Education. Upon the initiative of the Council committee the Department of Superintendence authorized the appointment of a committee of five at the meeting of the Department in Mobile in February, 1911. The earlier efforts of this committee were directed toward arriving at an understanding of the meaning and scope of the problem and in enlisting the co-operation of those who can aid in a fundamental way in its solution.

Preliminary reports defining in outline form the scope of the problem and the possible lines of attack in its solution were made at the meetings of the Department in St. Louis in 1912 and in Philadelphia in 1913. At the meeting of the Department one year ago in Richmond, two typical reports on English and arithmetic were presented as illustrative of the type of studies which the committee had come to believe should be made in all subjects, in the interest of determining the proper content for the subjects of study in the elementary curriculum. The Department responded to the presentation of these reports and to the projected plan for treating all subjects in the elementary curriculum similarly most enthusiastically by recommending that an appropriation sufficient to defray the expenses of such a piece of work be made, and guaranteeing the provision of the same in case the Executive Committee of the National Education Association found it impossible to appropriate the money from funds at its disposal.

While the Department committee was made responsible by a resolution adopted at the meeting of the Department in St. Louis in 1912 for studying possible ways of economizing time both in the elementary and in secondary schools, our attention thus far has been mainly directed, and in this report is wholly directed, to the study of elementary-school problems, reserving until a later time the study of such problems in the secondary field as are vitally related.

In the report referred to above the Council Committee on Economy of Time in Education brought forcibly to the attention of the country the desirability of shortening the period of formal education. The following proposals pertinent to the purposes of the Department Committee on Economy of Time in Education are quoted (see pp. 18 and 19):

1. The contemporary judgment is that the period of general education should be shortened at least two years.

4. In the elementary and secondary period, economy through selection, elimination, vital methods, relation to modern life, would yield much better results and little or nothing would be lost by the proposed change in time.

8. To define the form of discussion, the following divisions of the entire period of general and special education are proposed:

Elementary education	6–12
Secondary education (2 divisions—4 years and 2 years)	12–18
College	18–20 or 16–20
University (graduate school and professional schools)	20–24

Preceding their statement of conclusions, the committee said:

When by economy—this does not mean more cramming, but less—as much can be accomplished in the elementary and secondary schools and in the first two years of college as is now done in the full sixteen years, the last two years of college can count toward graduate and professional degrees and two years in the whole period can be saved.

Upon the general thesis that the period of formal education should be shortened there appears to be fairly general agreement. Where and how this shortening is to take place is, however, not so generally agreed upon. The committee of the Council believes that the greatest waste in education is in the elementary schools and has recommended that the period of elementary education be reduced to six years, maintaining that the essential knowledge, habits, ideals, and attitudes for individual and social needs can be and should be acquired in that time. This attitude on the part of the Council was evidenced in the resolution proposed by Professor Suzzallo of the committee of the Council in closing his address before the meeting of the Department of Superintendence at Mobile, as follows:

The main requirement at this point in our progress is to investigate the waste in the elementary schools and to make definite proposals for eliminating the archaic and least useful materials of the course of study and to propose more economic methods of teaching. To this end I move that the Department of Superintendence appoint a committee of five on Economy of Time in Elementary Education, this committee of five to co-operate with the general Committee on Economy of Time in Education.

The same attitude is further indicated in the following quotations from the report of the Council:

We approach now the question of saving time in the elementary period or of accomplishing more within the time. . . . . The committee agrees that there is much waste in elementary education and that the elementary period should

be from six to twelve. Nearly all our correspondents are emphatic regarding waste and the importance of shortening the entire period of general education. Saving of time can be made in the following ways:

1. The principle of selection is, first: Choose the most important subjects and the most important topics; make a distinction between first-rate facts and principles and tenth-rate; prune thoroughly, stick to the elements of a subject; do not try to teach everything that is good; confine the period of elementary education to mastering the tools of education. This does not prevent inspirational work, which is a demand on the skill of the teacher rather than on time. A great secret of education is to accomplish a maximum of training with a minimum of material. This is especially true of formal subjects; it is true also of inspirational subjects, in that after a general survey of the field emphasis should be placed upon a few selected points. Under the conditions above enumerated the formal elementary period can end in six years.

The committee of the National Department of Superintendence is not yet committed to the thesis that it is necessary or desirable to shorten the period of elementary education. It does, however, agree with the Council committee that there is great waste in elementary education and that either the period should be shortened or that more should be accomplished in the time allotted, or both. Economy of time in elementary education may mean either a shortening of the period of formal education or the more economical use of the time required, whatever it may be, in order that the maximum accomplishment in knowledge and skill may result. It is the latter conception of educational economy that is the more fundamental. The significant problem, then, is not what can be done to accomplish in six years what now requires eight years, but what can be done in the elementary schools of our democracy to secure that degree of accomplishment in knowledge, character, and skill essential to equip those who finish the elementary schools with an intense desire and the training necessary to make the greatest possible additional personal growth and with the disposition and ability to contribute to the welfare of society. Society is still depending primarily upon the elementary schools to furnish not only the tools of knowledge but also those facts, concepts, and principles essential in a democracy to common discussion and to the collective consideration of common problems. The training of the elementary schools must supply the requisite basis for "mutual intercourse, mutual understanding, and mutual sympathy," which are absolutely essential to a successful democracy. It is from the point of view of insuring that the schools supply this common basis for conference and

intercourse that the determination of the indispensable content for each subject of study is of paramount significance. We must determine what the absolute essentials are in the equipment of our citizenship that they may discuss and confer on a sufficiently high level to insure the progressive evolution of our democratic society. By concentrating our teaching efforts upon these essentials, their thorough teaching and permanent fixation will be insured in the minimum time.

Our first objective, therefore, is not merely time gain. If gain is accomplished, it must issue because the efficiency can be secured in less time. Saving of time is undoubtedly desirable if it can be secured without sacrificing efficiency. The saving of time will not only result in less cost to the taxpayers for the maintenance of the public schools but it will likewise result in increasing the earning power of those who graduate from these schools, owing to their earlier entrance into remunerative occupations.

Economy in time under either conception may be attained (1) by the elimination of nonessential subjects or subject-matter and by including only such additional significant material as is clearly vital in realizing the ends of elementary education; (2) by the improvement in methods of teaching and learning; (3) by the organization of the whole school system and the course of study so that each part may be taken at the optimal time in the child's development. In view of the objectives in appointing the committee from the Department of Superintendence, attention is first devoted to (1) in this report. For logical reasons also (1) should be treated first.

The ideally constructed course of study for the elementary schools in the interest of providing adequate general education is one stripped of all content not essential to the needs of modern life and organized so as to harmonize with the child's growth in capacity and experience. Its presentation with due regard to the most efficient methods of teaching and learning must be assumed, of course, if it is to secure the largest possible results. With reference to this task Professor Dewey says the problem is "the selection of the kind, variety, and due proportion of subjects answering most definitely to the dominant needs and powers of presentation that will cause the selected material to enter vitally into growth."[1] Again he says: "The selection and grading of material in the course of study must be done with reference to the proper

[1] See Dewey "The Psychology of the Elementary Curriculum" in *The School and the Child.*

nutrition of the dominant directions of activity in a given period. The difficulty is in seeing just what materials and methods, in what proportion and arrangement, are available and helpful at a given time."[1]

Before the question can be convincingly answered whether the period of elementary education can be shortened, it would seem necessary to determine the minimum standard curriculum selected and organized to meet fully the general aims or purposes of elementary education, specifying a minimum essential content for each subject of this standard curriculum. Whether the aims of the elementary school can be satisfactorily realized in six years or not, or in what time they can be realized, can be discovered only after such a determination has been made. In other words, we must work out a minimum content for each subject of study, holding in mind those standards of attainment which good teaching should seek to approximate. With this tentatively accomplished, we shall have a basis for determining the standard time required for executing such a course of study.

Whatever time may ultimately prove to be necessary, the fundamental questions are: (1) What subjects are essential constituents of the elementary curriculum? (2) What is the absolutely essential content in each subject? It is the second question on which the Department committee and the co-operating investigators have been working during the past year. The results of these investigations follow in this *Yearbook*. It is perhaps unnecessary to point out what a careful reading will render evident, that in the time available it was impossible to make the reports more than partial and tentative. Not only do the results submitted need the testing of use and criticism, but much more work remains to be done.

The formulation of a minimum essential content for any school subject is a complex problem and is beset with theoretical and practical difficulties. Various methods of procedure may be adopted: (1) An examination may be made of representative curricula the country over to determine the consensus of experience and practice as to the topics to be included, time to be allotted, etc. (2) Subject-matter to be included and time allotments may be determined on the basis of judgments of superintendents, principals, teachers, subject-matter experts, and students of education. (3) An examination may be made of progressive experiments designed to secure economy in time either by elimination

[1] *Op. cit.*

or by improvements in methods and organization. (4) Each part or each subject may be subjected to some more fundamental educational criteria or tests of inclusion, emphasis, or exclusion. Until there are definitely established and accepted standards of attainment based on individual capacities and social needs, the determination of minimum essentials by any method is a difficult problem.

Is it possible to arrive at a definition of the function of the elementary school which will be generally accepted? And more especially, is it possible to derive from such a definition acceptable fundamental principles which may guide in determining the minimum essentials in school subjects? Apparently our leaders in education agree that the function of the elementary school is to provide those educational opportunities necessary to insure, with the assistance of the other institutions of society, the acquisition on the part of elementary-school children of those habits, skills, knowledges, ideals, and prejudices which must be made the common property of all, that each may be an efficient member of a progressive democratic society, possessing the power of self-support and self-direction, the capacity and disposition for co-operative effort, and, if possible, the ability to direct others in positions of responsibility requiring administrative capacity.

The selection of subject-matter for any given period must be made with reference to the capacities and interests of children at this period and with reference to common social needs. Ultimately, the content and emphasis in each subject of study is determined by society's judgment in reference to its needs, while the organization of this content and the methods which shall be employed in teaching children are determined by the nature, ability, and interests of the children to be taught.

Two general principles of inclusion of subject-matter may therefore be formulated thus: (1) Whatever is included in any subject for any age must be reasonably comprehensible by children of that age. (2) Whatever is included must minister to the social needs common to ordinary American children. Corresponding principles of elimination may be formulated thus: (1) Subject-matter too difficult for the majority of normal children without undue expenditure of time and energy must be excluded. (2) Subject-matter that is not essential for at least the majority of children must be excluded. The fixing of minimum essentials upon any other basis than the abilities and social needs of the majority of children leads at once into difficulties. A curriculum or a content

for any subject based on the ability and needs common to all normal children gives an impossibly low standard. One based on the capacities and needs of 75 per cent of children is likewise too low to be useful. On the other hand, a minimum standard which is adjusted to the capacities of but 50 per cent of children is a misnomer.

The only escape from the dilemma is a graduated series of essentials progressing from the skills and abilities necessary for all normal children up through those that are desirable for all normal children, if they can be attained. The great variability in individual capacities and the possibly equally great variability in individual needs for effective social adjustment make any other basis of selection impossible.

If it is impossible to discover from educational theory fundamental tests for exclusion or inclusion, we are driven to the method of determining minimum essentials on the basis of the best current practices and experimentation which give satisfactory results. Those results are satisfactory which meet adequately the common needs of life in society. This in the main is the method employed in the investigations upon which the following reports in the *Yearbook* are based.

Following the introduction, Part I, the report consists of three parts. In the general survey, constituting Part II, Professor Henry W. Holmes reports a study of the time distribution by subjects and grades in 50 representative cities selected at random, which was made as a means of determining the current practice in reference to the grade in which the various subjects of the elementary schools are taught and to the time which is devoted to their teaching. His conclusions are summarized on p. 21 *infra*. Following this, Professor Frank E. Thompson has characterized the types to which experiments in economizing time in the country at large can be reduced. He holds, on the evidence of reports from progressive educators in all parts of the country, that there is a strong movement for educational efficiency, but that the movement is essentially for rearrangement and new emphases: very few would reduce the total time.

Parts III and IV of the report are devoted to such studies in the subjects of reading, writing, spelling, composition, and grammar, history, geography, and literature as were possible and necessary to enable those in charge of the studies to make a tentative formulation of the minimum requirements in each of the subjects. Part III deals with the formal subjects. Part IV presents reports regarding the essentials in the content subjects of history, geography, and literature.

Three reports are presented touching the formal aspects of oral and silent reading. The determination of the minimum essentials in reading involves two problems: (1) the determination of standard vocabularies, and (2) the determination of standard rates of reading. Superintendent Jones discusses the first of these, setting forth the procedure employed in determining standard vocabularies and in applying the same in testing the reading ability of pupils. Mr. Courtis' report deals with the determination and application of standard rates in reading. He sets forth the elements entering into skill in reading and defines the degrees of skill that are produced at each grade by present training, thus establishing the basis for indicating quantitatively the minimum reading ability in amount and degree of assimilation which should be attained in each grade. The practical advantage of objective standards in reading to classroom teachers and administrators is concretely set forth, and the procedure contended for in reading is supported by stating briefly the objective standards which have been developed in writing, composition, arithmetic, and spelling. To these reports has been added a selected bibliography, prepared by Mr. Gray, with a brief characterization of each reference.

The standard for quality and speed in writing which should be required in grades two to eight inclusive was derived by Professor Freeman upon the basis of the returns (1) in a writing test from fifty-six cities of the United States having a population of 30,000 or over, and (2) in a questionnaire sent to various employers of clerical workers in Chicago. The questionnaire sought information regarding the degree of excellence in writing which employers require of applicants for positions. This information was of value in determining the standard of attainment in writing which pupils should reach by the end of the elementary schools. The report also makes valuable tentative suggestions in reference to the time which is necessary per day in each grade for attaining the standards proposed.

Mr. Pryor's report on spelling discusses both the minimum content and the minimum time. He reviews briefly the word lists developed by Ayres, Jones, and others and concludes that from 750 to 1,000 words (no list is offered) are sufficient in the spelling course for the elementary schools. It is suggested from rather limited data that the tendency is to reduce the time formerly devoted to spelling and that this reduction is made possible by improved methods of teaching. The use of such scales as those developed by Buckingham and Ayres in determining word

lists, spelling efficiency, and requisite time for spelling is briefly indicated. A carefully selected bibliography concludes the report.

In his discussion of language and grammar, Professor Hosic has reviewed very thoroughly all experiments and investigations in English which are germane to his problem. The various scales available for measuring the worth of English composition are carefully evaluated and the studies of basic importance in determining the content of technical instruction in English are reviewed for their contribution to the task in hand. The standards in English proposed before the Secondary Department of the National Education Association in 1908 and before the Commission on the Reorganization of Secondary Education in 1914 are considered as to their bearing on the present undertaking. Professor Hosic finds the time devoted to language in the elementary schools cannot likely be cut down with safety. He urges the need for more definite standards of omission and inclusion, the better organization and teaching of the content retained, the establishment of more definite goals of achievement, and the development of more adequate and practical scales for the measurement of the results of English work. The report closes with a very complete and carefully analyzed bibliography.

Arithmetic is the last subject discussed in Part III. Professor Jessup's recommendations are not only based upon a careful review and consideration of all other relevant studies and investigations but also upon the return showing the practice in the content of arithmetic in 867 cities having a population of 4,000 or over and in 114 counties of the United States. The following topics are treated statistically from the data secured: (1) the elimination of topics; (2) increased emphasis on topics; (3) the recitation-time distribution; (4) the percentage of drill; (5) grade textbook introduction; (6) grade emphasis on topics. A definite standard for attainment in the fundamentals is proposed for each grade, and in conclusion a reduction in the time devoted to arithmetic is recommended.

In Part IV, Professor W. C. Bagley describes three methods which have been employed under his guidance for determining the content in geography and history which it is most important to teach and reports tentatively the results derived from the application of each method. Use of the "newspaper-magazine" method developed suggestive data for both geography and history. The methods of determining minima

by taking the "judgments of specialists" and by "a comparison of school texts" were employed with significant results in history. The tentative results are valuable as guides in the determination of the minimum essentials in geography and history and in indicating the proper emphasis in teaching these essentials.

Professor Hosic treats literature and his contribution will be found on p. 147.

Even a general study of the following report will render it evident that the task of formulating completely the minimum essentials in the subjects treated has not been finished. As much has been accomplished, perhaps, as it was reasonable to expect in the time available to those making the reports. In the present state of our knowledge of social and educational values it is not possible to complete the task with any mathematical certainty that the results offered would meet the educational needs even in a single community. The undertaking is increasingly difficult when the formulation offered is intended to serve as a guide in course of study-making for the elementary schools of the whole United States. Further time and more extended opportunity for conference and experimentation would render it possible to be more specific as to details. The report on language and grammar, history and geography, call particular attention to this. Nothing like the degree of completeness secured in these reports would have been possible but for the existence of the investigators who co-operated with the committee, taking complete charge of the reports as they appear below.

The omission from treatment in this report of the subjects of music, drawing, sewing, cooking, manual training, other forms of handwork, and nature-study, or elementary science, must not be interpreted either to mean that their content is not in need of critical evaluation or that their importance in the curriculum is undervalued. Rather, it was found impossible to add them to the subjects considered and to bring all the matter which this would render necessary to treat within the limits it seemed reasonable to set for this report.

Even if the problem attempted in this report had been more adequately done, only a fair beginning would have been made in the undertaking to accomplish all of the economies which are both possible and desirable in elementary-school education. Further work in this field with the view of completing it for the time being may yet be secured if it seems desirable. There will still remain, however, the problem of

improving the organization of the system and the technique of classroom teaching, that the minimum essentials in the curriculum may exercise the maximum of educational effect with the greatest possible economy of time and effort.

(Signed) H. B. WILSON, *Chairman*
JOHN H. FRANCIS
FRANK E. SPAULDING
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Committee

PART II

GENERAL SURVEY

CHAPTER II

TIME DISTRIBUTIONS BY SUBJECTS AND GRADES IN REPRESENTATIVE CITIES

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AND

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I

This report deals with the distribution of time by subjects and grades in the elementary schools of fifty[1] American cities, representing all sections of the country and a wide variety of conditions. The outstanding fact of the report is the great divergence in the allotments—there is still marked disagreement as to the distribution of time (and hence of attention and energy) among the elementary-school subjects. Such

[1] Baltimore, Md.; Berkeley, Cal.; Boise, Idaho; Boston, Mass.; Boulder, Colo.; Cheyenne, Wyo.; Cincinnati, Ohio; Detroit, Mich.; East Orange, N.J.; Fargo, N.D.; Frankfort, Ind.; Freeport, Ill.; Haverford, Pa.; Indianapolis, Ind.; Kansas City, Kan.; Lexington, Ky.; Lincoln, Neb.; Louisville, Ky.; Madison, Wis.; Manchester, N.H.; Milwaukee, Wis.; Minneapolis, Minn.; Montclair, N.J.; Montpelier, Vt.; Mt. Vernon, N.Y.; Nashville, Tenn.; Newark, N.J.; New Haven, Conn.; New Orleans, La.; Newton, Mass.; Omaha, Neb.; Passaic, N.J.; Philadelphia, Pa.; Phoenix, Ark.; Providence, R.I.; Rochester, N.Y.; Sacramento, Cal.; Salt Lake City, Utah; San Francisco, Cal.; Seattle, Wash.; Sioux Falls, S.D.; Solvay, N.Y.; Southington, Conn.; St. Louis, Mo.; Spokane, Wash.; Tacoma, Wash.; Topeka, Kan.; Washington, D.C.; Westerly, R.I.; Wheeling, W.Va. Other cities responded, but in some cases the data came too late and in others we could not use them. We found it necessary, for instance, to deal only with eight-grade systems.

disagreement is doubtless in part irremediable—in so far, for example, as it is due to legitimate differences in the length of the school course or of the school year, or to legitimate differences in public demand, or to fundamental differences in school populations. But in part it is caused by differences of opinion as to points on which opinion may gradually give way to knowledge; as, for example, the subjects to be commonly taught, their relative social values, their essential content, reasonable standards of accomplishment, the amount of time needed to reach such standards, and the most effective methods. Until we can decide such points our tables of time allotments are but guesses, and an average of allotments but an average guess. A statistical standard, however, is better than none, since it shows at any rate the trend of opinion and practice.[1]

II

Official tables of time allotments do not, of course, represent actual distributions of time. Teachers depart from the schedule for various reasons, good or bad, and there are many interruptions in the work of the school year. No child gets just the number of hours of classwork in arithmetic, or any other subject, which the published school schedule promises him. Eventually our standards must be based on the study of time actually consumed; but even then we shall have to allow for obstacles and interruptions, and meanwhile the assigned times show at least the official prescriptions from which actual times differ. They give us starting-points.

In studying official allotments, however, difficulties arise from differences in the use and meaning of terms. Our definitions of subjects are not settled: topics included under language in one city may be included under composition or grammar in another; nature-study may include elementary science or be included with it or be linked with geography; the assignment for phonics may be separate from that for reading or included in it. Such differences point to the need of accepted definitions and authoritative recommendations on the distinctions between subjects.

[1] The only two treatments of exactly this subject which our subcommittee on bibliography was able to find were Payne's *Elementary School Curricula* (Silver, Burdett & Co., 1895) and Elson and Bachman's article in the March, 1910, number of the *Elementary School Teacher*. The Seminary plans to make a subsequent and more complete study for the sake of comparing present time allotments with those tabulated by Payne. We hope also to make comparisons of cities by groups.

In advance of all experimental determination of minimum essentials or of standard accomplishment our elementary-school practice would profit by careful analysis of the program for delimitation of fields. Interest in correlation and in the motivation of learning has kept us from distinguishing our aims with that clarity and perspective which are necessary for the most effective organization of our work. We cannot advance by avoiding distinctions. To vitalize and socialize elementary-school work we need, not less organization, but more careful organization, with clearer differentiation of subjects through more penetrating analysis of aims.

This is by no means to deny that the clearest definition of subjects would still leave us far from solving the problem of time allotments. We should still have to establish the scope of each subject. If we know what arithmetic and history mean, we do not yet know what topics each should include. At this problem school officers and teachers are continually at work, and our present effort to define minimum essentials by experiment and investigation is an essential step toward its final solution. We cannot tell how much time ought to be given to arithmetic until we know how much arithmetic is to be taught; nor indeed even then, for we must next determine how much time is necessary to reach a defined standard of achievement. This is the chief reason why a study of time allotments can be only an outpost skirmish in the fight for economy of time in elementary education.

In this report we have had to ignore fundamental differences in definitions of subjects and in their content. Choosing a set of terms generally in use, we have set down the times assigned under the chosen headings, interpreting unusual terms by reference to the courses of study which accompanied the schedules. If in a given schedule allotments were made under headings not included under our definitions, we left them out. Our percentages were reckoned on the total time given in all the schedules to certain subjects included in our list. In many cases we wrote for an estimated division of time between allotments separate on our list but combined in the schedule sent to us (e.g., physical training and recesses).

We have used an eight-grade scheme for our calculations. In the case of half-yearly-promotion systems we combined assignments for the two halves of each year to get the total for that year.

III

The headings under which we classified allotments were as follows:

1. Opening exercises, including allotments in ethics, etc.
2. Reading, including phonics, literature, dramatics, story-telling, memorization of poems, etc.
3. Language, including composition, grammar, punctuation, pronunciation, word-study, etc.
4. Spelling.
5. Penmanship.
6. Arithmetic, including algebra, geometry, business arithmetic.
7. Geography, including physical and commercial geography.
8. History, including civics.
9. Science, including nature-study, elementary science, physiology, and hygiene.
10. Drawing, including picture-study, art, etc.
11. Manual training, including industrial training, handwork, etc.
12. Physical training, including athletics, gymnastics, folk-dancing.
13. Recess.
14. Miscellaneous, including unassigned time, study.

We do not recommend these headings. We used them because we found them convenient. We plan to study the differences in content under all the headings given in the fifty cities and in others and to publish a subsequent report dealing with the headings under which allotments are made and the topics covered by courses of study.

Table I gives the total time assigned to each subject. "Total time" means the number of hours devoted to the subject in all grades. In order to get this figure we often had to multiply minutes per week by the number of weeks of school in the city in question, and reduce to hours. The total time for the whole course and for the year seemed to us the significant figures for this particular investigation. Any child progressing, without repetition of a grade and without "skipping," through all the grades in a given city would spend the number of hours on a given subject which we have called the total time for that subject in that city. The table gives the number of cities allotting time to each subject, the average total time for all the cities in which allotments to that subject were made, the lowest total time in any city, the highest, and the average deviation. It gives also the average *percentage* of time devoted to each of the "recitation-subjects" (opening exercises, physical training,

TABLE I

	Opening Exercises	Reading	Language	Spelling	Penmanship	Arithmetic	Geography	History	Science	Drawing	Music	Manual Training	Physical Training	Recess	Miscellaneous
Number of cities allotting time in any grade	45	50	50	50	49	50	50	50	47	48	49	46	46	40	28
Average total time*	269	1311	849	454	362	981	474	360	279	410	366	316	343	565	397
Lowest total time allotted in any city	116	675	119	216	244	456	202	140	54	242	135	76	40	240	39
Highest total time allotted in any city	487	2900	1267	774	533	1380	750	700	593	760	600	965	918	933	2018
Average deviation (in hours)*	71	309	163	115	62	175	103	75	106	72	58	132	120	133	237
Percentage of average total recitation time†	.....	26.3	13.8	7.4	5.9	15.9	7.7	5.8	4.5	6.7	5.9	5.1	.....	.....	.....

* Only cities allotting time considered.

† Reckoned on the sum of the averages for the indicated subjects.

recesses, and miscellaneous being omitted), reckoned on the sum of the average total times for the recitation subjects in cities which publish allotments for those subjects.

This table shows, therefore, how generally allotments are published for each subject in our list; how near the cities are to agreement as to the time needed for each subject (admitting the lack of agreement as to what shall be attempted in each); and the general trend as to division of time among the subjects.

Table II is a grade table. It shows the average total time for each subject in each grade; that is, the number of hours spent on that subject in each grade (on the average) in the cities in which allotments for that subject in that grade are given. This figure we have called the "average grade time." Where we found such a record as "Nature-study included under reading in Grades I, II, and III," we gave the whole allotment to reading, under which it was published. The table also shows the number of cities giving allotments to any given subject in any given grade. It shows the percentage of time devoted to the several "recitation" subjects in each grade, reckoned on the sum of the average grade times for the "recitation" subjects in that grade. It shows also the lowest allotment in each subject in each grade and the highest.

From Table II a roughly accurate table of average allotments in minutes per week may be derived by dividing the average grade times by 38.75, the average number of weeks in which schools in these fifty cities are in operation, and reducing to minutes.

The following conclusions concerning contemporary school practice seem to us to be supported by the facts given in the tables:

1. The school arts still have the lion's share of attention. Reading, language, spelling, penmanship, and arithmetic—five subjects out of eleven in the "recitation" group—take about 70 per cent of the time spent in strictly class work. These subjects, with history and geography, take over 82 per cent of the "recitation" time. All the cities allot time to all these subjects except penmanship, which is "incidental" in one schedule. No other group shows similar agreement. But the average deviations are larger in reading, language, and arithmetic than in any other subject except "miscellaneous." In reading, the extreme variation is noticeably large, over two thousand hours—more than two years of school life. We need standardization most in the standard subjects.

Grade		Music	Manual Training	Physical Training	Recess	Miscellaneous
I	Cities allotting	10	19	43	37	18
	Average allotment	45	42	46	87	76
	Percentage average	5.2	4.8	...	...	...
	Lowest–highest	5 – 67	15 – 100	6 – 117	33 – 120	15 – 233
II	Cities allotting	10	19	43	40	22
	Average allotment	84	47	41	83	63
	Percentage average	9.3	5.1	...	...	...
	Lowest–highest	10 – 55	15 – 100	6 – 117	33 – 133	17 – 277
III	Cities allotting	10	23	43	40	21
	Average allotment	47	40	40	83	87
	Percentage average	5.1	4.5	...	...	...
	Lowest–highest	5 – 75	10 – 100	7 – 133	48 – 133	19 – 383
IV	Cities allotting	10	26	42	41	24
	Average allotment	48	45	40	77	77
	Percentage average	4.9	46	...	...	...
	Lowest–highest	8 – 75	10 – 133	7 – 117	25 – 130	3 – 357
V	Cities allotting	10	32	43	4	23
	Average allotment	45	50	38	73	70
	Percentage average	4.7	5.2	...	...	...
	Lowest–highest	8 – 67	24 – 133	7 – 117	25 – 108	3 – 357
VI	Cities allotting	10	37	43	40	23
	Average allotment	45	57	40	70	78
	Percentage average	4.6	5.8	...	...	...
	Lowest–highest	8 – 67	18 – 160	6 – 133	32 – 108	3 – 357
VII	Cities allotting	10	44	44	37	26
	Average allotment	45	72	38	66	78
	Percentage average	4.4	7.1	...	...	...
	Lowest–highest	8 – 67	18 – 233	6 – 133	31 – 108	7 – 320
VIII	Cities allotting	10	44	43	37	22
	Average allotment	44	74	39	66	87
	Percentage average	4.4	7.4	...	...	...
	Lowest–highest	8 – 67	18 – 253	6 – 133	31 – 106	10 – 370

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2. Both music and drawing have a fuller share of educational confidence than science or manual training or physical training. Each has a larger total time allotment, a larger percentage of recitation time, and fuller agreement in assignment of time, both as to the number of cities allotting hours and as to deviation of allotments.

3. In manual training and physical training the extreme deviations and the average deviations are very large, but not so large as in reading and arithmetic. There is less agreement as to allotment for these subjects, however, than for any others except opening exercises, recess, and "miscellaneous."

4. Recess takes more time than any subject except reading and arithmetic. This fact brings to mind a whole series of problems in the hygiene of the program and the management of organized play.

5. The large deviations for "miscellaneous" show how far we are from agreement on study hours, individual work with pupils, self-organized group work, and in general the use of free time, and hence of freedom by both teachers and pupils.

6. There is little agreement as to the grade and the allotment for the beginnings of any of the "accepted" subjects except reading: most of the cities, but not all, start language, spelling, penmanship, and arithmetic in Grade I. There is practical agreement to start them all in Grade II, although spelling and language do not get a unanimous vote till Grade III. Geography waits for agreement till Grade IV; for unanimity, till Grade V. History is not taught by all the cities till Grade VIII.

CHAPTER III

TYPICAL EXPERIMENTS FOR ECONOMIZING TIME IN ELEMENTARY SCHOOLS

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I

When the topic for this paper was assigned it was the intention of the committee as well as of the writer to bring and have brought together accounts of at least a fair part of all the things that are being done in the country in school affairs to the end of economizing time. It was further intended to make careful examination of all of these things and to reduce them if possible to types, describing under each type all specific instances that could be discovered. Two limitations, at least, have made so ambitious a program impossible: the one a limitation of time, the other a limitation of space. It would require as much space for such a presentation as a full *Yearbook*, and it would require some months to put the thing together, in presentable form, with due justice to each and every instance. That there is so much material has been, and is, one of the chief surprises of the investigation. It can be said without exaggeration that, consciously or unconsciously, and most frequently consciously, educators in every part of the country are doing things and planning things which will eventuate in more economical procedures and larger results.

The paper which it was planned to publish will be published in some form shortly, perhaps as "A Survey of Hopeful Progressive Tendencies in American Education." There is ample material, and excellent material too, for a chapter or even a book on this subject. This paper, however, must be limited to some general observations on the economizing of time and a brief but, it is hoped, a faithful characterization of the types to which the various experiments are readily reduced. In the first place, let it be said that all of the persons who are experimenting, and the hundred or so who have taken the trouble, often a great deal of

trouble, to respond to inquiries, are apparently impressed deeply with the belief that so far the possibilities of our education have not been anywhere near realized. Furthermore, and this is an exceedingly healthful condition, they believe pretty generally that it is not one little thing nor even some one considerable thing that is needed to make the system yield these larger results. A surprising proportion of those who have answered—easily 75 per cent—indicate more or less explicitly their conviction that all of our educational procedure will need to be examined and later adjusted, one part to another and every part to every other part, before it will produce results commensurate with its possibility. The same persons seem confident that such readjustment is entirely feasible, is even already well begun. Not many have indicated very much interest in the shortening of the period of education, but almost everyone, explicitly or by implication, would have much more accomplished within this period. The impression would seem to be that our aims for education are not far from right, that our materials, generally speaking, are not badly suited, and, with a few exceptions, that the period in which our work is to be done is about right, but that so far we have not begun to arrange these materials nor emphasize activities to the attainment of aims within the time allowed to anything like their possibilities. Fully nine-tenths of the experiments and suggestions reduce to attempts at better sequence of subject-matter, better correlation with the pupil's ability or with other subjects, more industry on the part of the pupil, more effective assistance by the teacher, and other things of the same general sort. Educators are trying to save time, not to the end of having more time for something else than education, but to the end of having more in it of education; in general, "economy of time" is but a synonym for "efficiency."

Despite the fact that the problem is not anywhere regarded as simple and that practically no one has a panacea to propose, the experiments under way, or suggested, readily reduce to comparatively few types. The experiments of each type all, or practically all, aim to do what was just suggested, namely, to make more of the possibilities inherent in materials, pupils, and teachers in the present time allotment. Apparent exceptions, such, for example, as shortening the elementary course of study one or two years, show on examination that the advocate contemplates for the pupil a longer course in school either in some trade or technical school, somewhere about the high-school age, or in professional,

cultural, or research activities at the graduate level. Almost no one indicates a wish to get the student completely out of school at an earlier age. Some would get the pupil in touch with life's activities earlier, but practically all would accomplish this either by bringing such activities more actually into the school or by taking the school (or its students) more into the midst of such activities. Again, no one seems anxious to terminate the child's connection with the schools at an earlier period. Though some of the types enumerated and some of the instances specified under the types which follow may not at first reveal their pertinence to the economizing of time, the instances have all been adduced as attempts at that end, many of them, of course, in the better-use-of-time sense.

II

BRIEF CHARACTERIZATION OF TYPES DISCOVERED

1. *Regroupings of the school years.*—The experiments under this type are numerous and include such regroupings as are commonly known as the six-six plan, the six-three-three plan, the seven-one-four plan, the six-two-four plan, the seven-five plan, and the seven-two-three plan. Closely associated with these in several instances are plans for the elimination of the eighth grade, but, on examination, in most instances there is no true elimination of the eighth-grade work. Some of it is usually found to be crowded down into the lower grades and some of it has been pushed ahead into the higher grades. Where, by this regrouping, "elementary" education is shortened, the purposes and probably the effects are the clearing of the course to some extent of nonessentials; the bringing of goals (such as graduation, the conclusion of a certain course of study, admission into a different kind of school, etc.) closer; getting pupils into intermediate or high-school work earlier; "speeding up"; keeping pupils in school longer; securing better correspondence of certain types of work with "epochs" in the child's life; dividing the work into more reasonable instalments; and providing better shunting-points that pupils may, to better advantage, change from one course or type of school to another parallel with it. According to testimony, these plans all work well, and inasmuch as the differences between them are not so great after all, especially at what may be regarded as the crucial point—the seventh and eighth grade—we may predict that some one of them, probably the six-three-three plan, will soon take a decided lead over the others and the present eight-four plan.

2. *Modifications of grading and promotion schemes.*—A great many schools are trying out grading and promotion schemes, in general by making more subdivisions of the year grade, such as half-year grades; term grades (usually twelve weeks); quarter-year grades; and no grades at all, that is, ungraded sections; "quick" and "slow" sections. Promotions, in most instances, are possible at any and all of these grade divisions; and over and above that, in some instances, by subjects, on the basis of special examinations; and for work carried "with honor." The purposes specified are: bringing goals closer; spurring the pupil to his best by competition with his own record, with the records of his school and of other schools, and with his fellows; making it possible for each pupil to find the pace best suited to his health, ambitions, or peculiarities; making possible a change of pace, without serious inconvenience, on occasion or necessity. Enthusiastic reports of good results are the rule in connection with this type of experiment, and there can be little doubt that much has been done and will be done in these ways to accommodate the individual pupil and to bring into education more effectively one of the greatest factors in any improved efficiency scheme—competition.

3. *Rearrangements and eliminations of subject-matter.*—These experiments might almost be classed as of two different types—rearrangements and eliminations—were it not for two facts which examination of them reveals: that the two are always complicated in any specific instance and that as a rule there is no real elimination, but rather minimization, transference, or substitution; for example, a topic may drop out of arithmetic but reappear, in modified form, in geography. It is difficult to characterize the experimentation of this type for the reason that it is going on in all of the subjects and in all of the grades. Perhaps the most salient thing to be noted is that a challenge of its right to its place and emphasis is being put to every subject and topic. Another salient characteristic is a search after logical and psychological sequence, correlation, and subordination. The aims most frequently specified are: to relieve the pupils of dead and uninteresting occupation; to employ them with things of which they can see the importance; to avoid cluttering their minds with bric-à-brac of curious and antique sort; to compensate for paucity of detail by clarity of outline; to secure the study of subjects at more favorable periods of the pupil's development; by correlation and concentration to "kill two birds with one stone."

4. *Extra-time and emphasis schemes.*—Extra time is provided for in after-school classes, special classes, evening schools, summer schools, and by ingenious adjustments in some instances which permit the pupil to emphasize his more difficult subjects in time taken from easier ones. The purposes of these experiments are variously specified as: giving the pupil a chance to keep up by means of extra work instead of falling behind; to get ahead in time or power if he choose; to maintain during interschool periods (for example, in the summer) a hard-earned momentum; to keep pupils in the spirit of school work; to save time that otherwise would have to be given to the warming-up process. Some of the most hopeful reports of progress have been given in connection with these innovations. In some places the whole spirit of schools and community would seem to have been changed. Comparison with European school systems, especially those of Germany, France, and Switzerland, tends to force upon us the conviction that so far we have not made enough of our schools in a time way, that is, they do not take up enough of our time, are not in our lives enough; modern industrial conditions no longer very generally justify numerous and long vacations. We are realizing more and more that education is not an incident of life, but, instead, a very large part of it. More than that, we are beginning to realize, when we think in world-terms, that preparation for the world's work cannot be made in brief and intermittent attacks.

5. *Tying the school up with the life and occupations of the community.*—This sort of thing is reported from every part of the country and usually as though it were (as it is) the discovery of the times. It takes on many forms, such as allowing credit for non-academic exercises in school-time; allowing credit for work done at home or in the shop or store; arranging for industrial work in connection with school work; introducing into the school the study of community phenomena; interesting the home, church, press, and other institutions in the school's activities. The reasons alleged are that these things make for greater attractiveness of school life, for insight into the relationships of school and life, for fuller occupation of the pupil's powers, for the larger power that comes through versatility. There can be no doubt that, rightly administered, all these advantages obtain and that all of the arguments urged in favor of extra-time schemes apply equally well here; in fact, these are the ways, to quite an extent, in which to expend extra time.

6. *Modifications of recitation, assignment, and study schemes.*—These instances are almost as numerous as the schools of the country, and the substitutions proposed for present usages are of every degree of ingenuity. That there are enormous unrealized possibilities in the contact of the pupil with the teacher and in the exercises in which the pupil engages, or should engage, seems to be a profound and widespread conviction. The more common instances reported are such as the setting aside of a part of the recitation period for supervised study; devoting different recitations to different and carefully discriminated uses, such as reviews; preparation for future lessons; application of principles to problems; giving pupils assignments of a degree of difficulty adjusted to age and experience—all to the end that the pupil may come to acquaintance with, and use of, his mind; acquaintance with, and respect for, the minds of others; capacity to express himself on short notice. All these and many more are legitimate aims of the recitation, the study period, and various less formalized school exercises. The agitation in this field is a matter of immense promise. We have long said that it is not what one does that counts so much, it is the manner in which he does it. We still more than half believe (the wish being father to the thought) that there is a good deal in formal discipline. Now that we are really looking into the possibilities of teacher-pupil and pupil-school contacts, we may expect to realize something as good as if not better than the things which formal discipline, were it a possibility, would give us.

7. *The training of superintendents, principals, and teachers for expert service.*—Here again the air is full of hope. Teacher-training institutions are seriously, and as never before, considering just what goes into the make-up of the successful teacher. The teacher is being analyzed out to his ultimate constituents. He is being thought of no longer, or at any rate not so much, in a sentimental way. He is an expert. His function is to help children to learn—to become. He is thought of as immoral if he wastes time or permits it to be wasted. He is being held almost universally to a more strict account than even the minister. A great many of those who report see in the teacher the key to the whole economy problem. He is the inspirer, the technically trained adviser, as well as and more than the taskmaster. Not only are certification requirements and plans for such requirements stipulating more in detail the teacher's qualifications, but numerous provisions are being made and

advocated for the improvement of teachers while in service. To make the teacher's profession one of dignity and worth could well be one of the most practical objectives in the campaign for wise economy of time; in fact, and obviously, no advanced ground can be taken and held without the dependable teacher.

8. *Measurement and appraisal of results.*—This is presented last, not because least in importance nor because less frequently mentioned, but rather because everything else is, in a way, dependent upon it. School people are trying everywhere, some with scientific insight and some without, to estimate the outcomes, the results, following upon their hard work. There is general, wholesale, and wholesome suspicion of ritual in education and conventional justifications of ritual. It is quite unnecessary here to mention the proposed tests and measurement scales with which we are all familiar, or the surveys which are being undertaken or have been completed in all parts of the country. It may not be irrelevant to call attention to the fact that even the rank-and-file teacher is beginning to talk in terms of surfaces of frequency, the personal equation, etc., and their relations to the marking system, and that even in remote places the superintendent or principal is discussing such matters in teachers' meetings. From the movement for standards and measurements it is expected that we shall be able better to say just what is being done, just what each is doing, so that the educator shall be guilty neither of too much nor of too little endeavor, that one pupil may be rated accurately with reference to another, that one school may be rated accurately with reference to another, that one teacher may be rated accurately with reference to another, all to the end that competition may be intelligently and effectively encouraged.

Some other types of "progressive experiments in economizing time" appear in the returns, but will not be discussed in this paper. One other at least ought to be mentioned—the general campaign for improvement of the health and "condition" of pupils—and its mention is probably sufficient to bring to mind its intimate and enormously important relation to any true economizing of time.

III

These gleanings, which are here so broadly sketched, seem to the writer to accord perfectly with the view expressed in the first section, that, essentially, the problem of economizing time in education in the

mind of the American educator reduces simply to making *better use* of time. Few persons, we take it, will be found who think that we have not time enough in which to do the work of education, and quite as few, probably, who think that the material, the subject-matter, available for education is not adequate. We have the things to do with and we have the time in which to do; we are doing pretty well as it is; but we are trying to do better—to use the materials we have, in the time we have, for the production of *better results*. We ought not to be in doubt as to the nature of these results; the very purpose of "America," its democracy, indicates as the duty and the program of education in America: *to raise the levels of skill, intelligence, and character in as many as possible, as high as possible, as soon as possible.* This is our aim of education, and this is why we should economize time.

To economize time it is required that the right persons, under the right leaders, shall use the right materials, at the right time, in the right way. The right persons are those who are in "condition" to work and who see that the work they are doing is pertinent to the attainment of reasonably immediate and attractive goals. The right leaders are those teachers, principals, superintendents who are clear as to the purpose and worth of life, who believe in life, and who are possessed of the appropriate knowledge and technique. The right materials are such exercises as will lead, and *can be seen by those who take them to lead*, definitely, and with fair directness, to worthy and desired goals. The right time is early—before the edge of interest is dulled—before irrelevant habits are formed. The right way is industriously, competitively, cheerfully; with as much freedom as possible from distraction; with occasional refreshment and reanimation.

The right carrying out of such a program requires the further segregation of its elements. It is necessary to see clearly the particular matters administration must work with and upon, that emphasis and correlation may be intelligent. It is necessary to figure out just what are the *means* of improvement—of economy. We shall not be far wrong if we say we are economizing or getting in a way to economize wherever we are really securing one or more of the following: (1) better "condition" of pupils; (2) more definite, attractive, and immediate, as well as distant, goals; (3) a course of study more pertinent in content and more psychological in sequence; (4) wiser, more tactful, and more human teachers; (5) a student-body more devoted and industrious, as well as

cheerful; (6) a completer elimination or minimization of distractions; (7) more timely beginnings in all activities; (8) more industrious prosecution of work; (9) keener competition of the pupil, with himself and with others; (10) saner refreshment and reanimation of pupils.

That these are the *means* to a higher educational efficiency—to the economizing of time—and that they are believed in by American educators, is made to look probable by the fact that practically all attempts, of which we have learned, to improve things, in whatever part of the country, readily appear as attempts to accomplish one or more of them. These attempts are various—are undertaken sometimes with more, often with less, vision of the whole problem, but all of them are earnest attempts and may be called, in the best sense of the term, "experiments" in economizing time.

PART III

MINIMUM STANDARDS AND CURRENT PRACTICES IN THE FORMAL SUBJECTS

CHAPTER IV

READING

INTRODUCTORY NOTE

The word "reading" is here used to include the formal aspects of oral and silent reading. The content aspect of reading is discussed in a later chapter on literature. The determination of the minimum essentials in reading involves two problems, one the determination of standard vocabularies and the other the determination of standard rates of reading. One of these is discussed by Mr. Jones and the other by Mr. Courtis. In view of the active scientific experimentation and investigation that are being carried on at the present time in the subject of reading, a select bibliography by Mr. Gray is provided in order to introduce the reader to some of the more recent experiments.

SECTION I

STANDARD VOCABULARY

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In devising a standard test for primary reading one of the first tasks is the determination of a standard vocabulary. There are two possible ways of determining such a standard vocabulary, and it appears that both ought to be used. In the first place, the vocabulary should be one that is fundamental to childhood itself; it should be composed of the words most commonly used by children of the primary grades. On the other hand, words belong to phonetic families and the mastery of one word of a family provides a key for unlocking the mysteries of all the other words of that phonetic family. Consequently, words should be

chosen so as to open a way to an understanding of all of the larger phonetic families. These two bases of choice of words for a standard vocabulary are not contradictory, since the largest phonetic families are usually the ones that furnish the most words to the vocabulary of childhood.

In determining the vocabulary that is thought to be common to childhood, an analysis was made of the vocabularies of ten primers in common use. The words were tabulated in two lists, one called the phonetic list, and the other, the sight list. In the phonetic list were tabulated all of those simple English words that belong to the 150 common phonetic families. These are mostly words of a single syllable. In the sight list were tabulated various irregular words that do not employ one of the common phonograms, and most words of two or more syllables.

Table I shows a part of each of these two lists. The words given are arranged in the order of the frequency of their occurrence in the ten primers analyzed. The figure before each word indicates the number of times it occurred.

TABLE I

Phonetic Words		Sight Words	
704	and	1,733	the
502	little	965	I
478	it	853	is
420	in	652	to
395	can	553	a
385	not	526	my
338	play	524	you
309	like	449	said
213	boy	389	see
206	ball	334	do
192	hen	331	he
178	run	315	we
176	that	278	have
176	up	277	come
170	now	237	me
169	big	224	are

Each of these two lists continues downward until it arrives at words that occur but once in the ten primers. In the phonetic list there are in all about 530 different words, and in the sight list about 430. Naturally these 960 words cannot be employed as a standard vocabulary.

It is necessary to take out the common elements from all of the primers. If one chooses from the sight list all of those occurring ten times or more, one has a list, not of 430 words, but of about 190 words. In selecting from the phonetic list the problem is more complicated. It is desirable to consider the frequency of recurrence of words, but at the same time it is desirable to consider the size of the phonetic family to which each of the words belongs.

In the solution of this complicated problem the first step was to determine the number of different words in common use belonging to each of the various phonic families. A mechanical word-building method was employed for gathering in all of the words belonging to each of the 150 common phonic families. To illustrate the matter, in Table II the middle column shows the phonic word-base. The column of figures to the left shows the number of words belonging to the phonic family using that particular word-base. The column of figures to the right shows the number of times any word occurs in the ten primers employing this particular word-base.

TABLE II

9	and	831	15	ank	49
13	an	622	16	ag	44
17	at	433	10	ang	22
8	am	164	5	ant	10
15	ack	130	15	ash	4
8	atch	117	5	ax	2
17	ap	104	8	ab	1
13	ad	78	8	amp	1

In actual practice it has seemed most convenient to keep the two lists of words separate. In drawing up a test of the ability of pupils to recognize the sight words one simply makes a random sampling from that portion of the list showing a frequency of ten words or over, each word in the test having a value equal to the frequency of its recurrence in the ten primers. The test of the phonic vocabulary is made up by taking a random sampling from the phonic list. The value of each word, however, is represented by the sum of the recurrences of all words of that phonic family in the ten primers. While the value of each word for test purposes of the sight list remains the same as shown in Table I, the values for the phonic list are as shown in Table III.

TABLE III

1,101	hit	395	pen
831	band	391	hall
739	say	359	gun
622	can	315	pig
611	fill	309	like
541	tin	253	red
489	cow	252	wet
433	cat	242	cup
426	not	228	thorn
403	make	228	kick

This list continues down to the point where the word-values are only ten. In making up any given test all the words belonging to the same family as "hit" have the same value, namely, 1,101. This includes such words as "it," "bit," "sit," "kit," etc. Because of this, while there are only 118 word-families having a phonetic value of ten or over, yet there are in fact several hundred available words.

In actual work one can use the two standard vocabulary lists and make separate tests, or he can choose words from both lists and make a single composite test. The test may be made by using lists of words for the pupil's recognition, or the words may be built into sentences and read by the pupil. Both plans are in fact used. Table IV on pp. 41 and 42 shows a list of words that was used in testing the first-grade class in two different ward-school buildings and the results of the test. A card on which the words were printed in primer type was placed in the hands of the pupil and the teacher had in her hand a card similar to the one shown in the cut. On this card there are twenty columns. Ten pupils are chosen by taking alternate pupils. Since this is a random sampling the results represent fairly well the ability of the class and the efficiency of the teacher. As the first pupil pronounces the words of his list, the teacher checks in column I on her card the word upon which the pupil fails. The column then presents a fair picture of the pupil's ability to recognize words of primer quality. The second column represents the ability of the second pupil, and so on through the ten chosen to represent the class.

The table shows that in school A the pupils are well graded. All do about equally well. Apparently a few word-families have not been taught. With the exception of these, practically all of the words of the

TABLE IV

First Grade

		School A										School B									
		Pupil										Pupil									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
622	man																				
104	cap																				
130	back																		o		
22	hang																		o		
44	flag																				
831	hand																				
117	catch																				
1	lamp																				
49	thank											o		o			o	o	o		
1	tramp																				
78	bad																		o		
433	hat																		o		
2	wax																				
731	gray																		o	o	
16	tail																		o		
11	pale							o				o			o						
403	cake																				
40	main							o		o											
6	cape	o	o	o	o	o	o	o	o	o					o				o		
82	spade	o	o			o	o		o	o											
40	plate		o												o			o	o	o	
2	table	o	o	o		o	o			o											
8	pane	o	o	o		o	o	o	o	o									o	o	
20	care	o	o	o			o			o											
252	get																		o		
253	bed																		o		
186	tell															o					
395	hen																				
4	mend						o								o				o		
4	begs																		o		
6	best		o							o				o					o		
34	dress																				
128	read														o				o		
17	feel		o				o			o								o			
204	beat		o				o			o						o	o	o	o		
65	dear																o	o	o		
25	been															o	o	o	o		
1,101	bit																o				
611	still																		o	o	
132	hid		o			o													o		
138	bring																	o	o	o	
228	stick																		o		
541	pin																		o		
70	drink																				
315	dig																	o	o		

TABLE IV—*Continued*

		School A										School B									
		Pupil										Pupil									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
4	mix																				
35	whip																	o	o		
4	rib												o		o		o	o	o		
140	swim																		o		
40	dish																		o		
64	side		o							o			o		o				o		
87	might	o					o		o												
15	high												o						o		
89	mind	o	o				o			o		o						o	o	o	
2	pipe																		o		
91	five																				
309	like																		o		
7	smile																				
80	rock												o					o			
426	spot																			o	
90	top																				
12	sod																	o	o		
3	toss																				
116	told																				
13	nose																				
76	boat												o						o		
26	rope																o		o	o	
16	tore																				
359	run																				
1	jump																				
242	up														o						
11	rub																	o	o		
130	dame																	o			
8	pane														o	o			o		
31	Grace									o				o			o		o	o	
17	street																				
95	keep																	o	o	o	
35	seed																		o	o	
26	week												o				o	o	o	o	
5	push																				
122	write														o				o	o	
44	fire														o				o		
43	time																		o		
45	full						o											o	o	o	
135	but						o												o		
102	duck																		o		
11,698																					

list are recognized by all of the pupils. School B is shown to be of a quite different character, although supposed to be doing exactly the same type of work. Apparently all of the word-families have been partially taught, but none of them has been taught well. Certain pupils make a high mark; others, one that is very low. Apparently the teacher is inefficient. Those who learn without much teaching have mastered the words; those who have special difficulties and require careful teaching have not mastered the words. The class is badly balanced as a consequence.

One objection arises in connection with this mode of making the test—the words in the list are not in their natural setting. A pupil might fail to recognize a word that stands in isolation in the list and yet be able to recognize that same word if he met with it in sentences that he was reading. For this reason the tests have been made up into sentence-forms and printed as reading-lessons. The pupil instead of reading down a list of words reads what appears to him to be a usual reading-lesson. The teacher, however, has a card in which the words are arranged in a column as in the other case, and she checks the words missed by the pupils in just the same manner.

In marking the individual pupils, or in marking the teacher, it is necessary to take into account the relative value of the word as shown by the figures indicating the frequency of its recurrence. It is a greater error for a pupil to miss the word "man," which has a recurrent value of 622, than it is to miss the word "cap," which has a recurrent value of only 104. In the test shown on the accompanying figure the total recurrent value of all the words was 11,698. This is the figure that will be received by a pupil in case he recognizes every word. This is the figure that will represent the efficiency of the teacher in case every pupil recognizes every word of the test. In making up the record for either pupil or teacher it is necessary to deduct from this total sum the sum of all of the words missed. The remainder is a coefficient of ability to recognize the words of the standard vocabulary by the pupil; and an average of these remainders is a coefficient of efficiency for the teacher.

SECTION 2

STANDARDS IN RATES OF READING

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The widespread interest in the movement for measurement in education is rapidly giving many investigators a new point of view. Measurement invariably leads to closer analysis and to a truer perception of the relative functions and worth of different phases of the work of any one type. It is not surprising, therefore, that in education the "yardstick" men are seeing more and more clearly that both the materials and the technique of teaching must be varied according to the results to be secured.

In a lesson designed to increase a child's appreciation of a great poem, for instance, a situation must be developed with a group of children, and the individuals of the group stimulated to react to the situation in such a way that each personality may make its own peculiar contribution according to its own peculiar interests and point of view. The lesson is successful only as it produces results which vary from individual to individual.

On the other hand, in a lesson designed to increase the child's mastery of the technique of reading, the work to be successful must eventually result in the attainment of a proper degree of skill. In such lessons the amount and character of the training each child receives must be varied according to his individual peculiarities and capacities, but the final product with all children should be the same. The uniformity of the product is here the chief characteristic of successful teaching.

The purpose of this report is to describe the results and conclusions reached in a first attack upon the problem of determining standard scores in some of the measurable elements that make up skill in reading. It is evident that before a uniform product can be secured there must be both an absolutely definite statement in objective terms of the goal to be reached, and a means of measuring the product at various stages of the process, to tell whether or not the goal has been attained. The two educational principles involved in such standardization may be concisely expressed as "definition of aim," and "limitation of training." Each will be briefly discussed before taking up the consideration of the experimental results.

Definition of aim.—It is the contention of the writer that, where the product is a mechanical skill, for successful teaching there must be a definite aim, and with this general statement probably few would quarrel. It is only as an effort is made to formulate the aim that difficulties arise in the minds of teachers. The general statement that schools should teach a child to read arouses no antagonism. But the "yardstick" men are not satisfied with such a statement. What does "to read" mean? Does a child know how to read who in half an hour is barely able to finish 100 words of simple prose, even if at the end of the time he understands perfectly all that he has read? Most courses of study say simply that a child should be able to read with a reasonable degree of skill for his grade. This investigation is an attempt to define the degrees of skill that are actually produced at each grade by present training.

The most evident measurable elements in skill in silent reading are the number of words read per minute and the degree of assimilation of the content. The first is easily measured, the second only indirectly through some form of reproduction. This introduces several foreign factors, and makes measurement and interpretation difficult. The most valuable product of the present study is, therefore, the knowledge gained as to the median rate of silent reading in the different grades. Accepting the median rates for each grade as the optimum rates, these results furnish the definite aims desired.

It should constantly be kept in mind throughout the discussions that follow that the study is suggestive only, its conclusions tentative. It represents an unsuccessful attack upon a complex problem, and its results are given here in the hope that it may lead others to check the conclusions reached and to repeat the work under more favorable conditions. Its chief value must be that it shows plainly the need of further studies of the same kind, and it furnishes tentative standards which will serve as a basis for experimentation on the part of those teachers who care to attempt the improvement of the efficiency of their teaching. It at least uncovers a problem whose solution would be of direct, practical, and lasting value, and it should serve to bring the question of objective definition of aim before those who have to do with the formulation of courses of study.

Limitation of training.—Anticipating somewhat the statistical data of the article, it may be said that the results show two striking characteristics: a great range of individual variation in every grade and a

constant average rate for any large group of a given grade. The great range of individual variation is a sign of inefficient teaching. In every grade there are some children who read very slowly or with great difficulty, and there are others who read very efficiently and at high speed. As there seems to be a well-marked value for average adult skill, it is quite probable that this represents the optimum rate at which the neuro-muscular co-ordinations involved in reading normally take place. If so, it is the duty of the elementary school to see that each individual attains this degree of skill. Otherwise he does not know "how to read." Moreover, the elementary school need not concern itself with the development of higher degrees of skill. As soon as the average adult rate has been reached, all time spent in *direct drill* tending to produce additional degrees of skill is likely to be waste. The bases for this statement are four: (1) By analogy from arithmetic, in which direct objective data for a similar statement have been secured, it is possible to say that after the optimum degree of skill has been attained *further development of skill* in reading is probably not a factor in determining the social efficiency of the individual, so that his time will be more profitably employed in other types of training; (2) individuals with greater natural capacities will reach the optimum level of ability with much less training than individuals less favored by natural inheritance; consequently for such individuals drill soon ceases to have any meaning, and may be positively harmful; (3) the development of higher levels of ability in preparation for a specific vocation is not the function of elementary-school training; (4) for the exceptionally able child the incidental training which comes through the use of any mechanical skill in real work—once the standard has been attained—will automatically develop his ability to higher levels without further direct drill, but it is the exceptionally able child *alone* who is thus able to profit by incidental training. Under such conditions it would seem wise to determine experimentally the optimum degree of skill needed by the average man, and deliberately to limit the training given by the school to the attainment of these standards. This implies, of course, a new form of schoolroom administration, one that will permit the shunting of an individual out of the training-class as soon as the required skill has been attained, and the putting of that skill to work in applied problems tending to develop the initiative and executive ability of the individual. As the experimental work of a few advance schools proves that such an arrangement

means a vastly increased efficiency of teaching, as well as a great improvement of the ultimate product, it is only a question of time before the principles of "definition of aim in objective terms," with consequent "limitation of training," will meet with general acceptance. In spite of its limitations, the results of the present study furnish tentative standards for a first experimental attack upon the problem of handling the teaching of reading from this point of view.

Turning now to the definite experiment to be reported, the tests will be described, a summary given of the results and conclusions reached, and a few suggestions made as to the value and use of the standards proposed.

The investigation of the rates at which children read was part of a larger co-operative investigation of the development of several of the abilities involved in training in English, and was carried on on a co-operative basis, following the general plan used by the writer in arithmetic. The tests were sold at cost to those who promised to send in duplicate copies of their results. Owing to the length and difficulty of the scoring, however, very few really sent in returns, and the standards are not as reliable as it was hoped they would be. The writer, however, is glad to acknowledge his indebtedness to the following: Miss E. M. Liggett, the Liggett School, Detroit, Mich.; English Committee, Teachers' Association, Detroit public schools; Mr. Charles M. Lamprey, Boston public schools; Professor Cyrus D. Mead, University of Cincinnati; Mr. D. F. Carpenter, superintendent of schools, Littleton, N.H.; Mr. H. L. Smith, superintendent of schools, Bloomington, Ind.; Miss Flora Wilber, City Normal School, Fort Wayne, Ind.

In this series of English tests, test No. 2 was the writing from dictation the first part of a simple story about a picture. For the third test the children were asked to compose the continuation of the story. When this was completed, they were given the real continuation of the story printed in 10-point type in lines 5 inches long, approximately 6 lines to the inch. The first section of the story (Part B) was 386 words long, and the children were glad to read it, to see how closely the "real" story agreed with the one they had written. They were asked to read at their natural rate, and all started at a given signal and were stopped at the end of one minute. A line was drawn around the last word read. This test will be called a test of normal reading. Immediately following this the children were measured as to their ability to remember whether

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Name _____ Grade _____

BESSIE'S ADVENTURES. PART B.

	No. of Words
Before the frightened little girl could decide what to do, the dog sat up on his hind legs and began to beg. He gave another impatient little "Bowl," but this time his bark did not seem so sharp and terrifying to Bessie, and her fears began to disappear. "Why, he's really a cute little doggie," she thought, and sitting up, she timidly offered him her bowl. The dog needed no second invitation, but eagerly lapped the milk until every drop was gone.	18 32 47 60 73 86
Bessie set the empty bowl down upon the doorstep and patted the little dog's head. He in turn was equally friendly, wagging his tail and trying to lick her hand. In a few minutes more the two were the best of friends, racing about the garden in a wild game of tag. Sometimes it was Bessie, laughing and screaming, who was chasing the dog this way and that in and out among the bushes of the garden; sometimes it was the dog, barking and jumping, who was chasing Bessie. More than once dog and girl were so much in each other's way that both fell down, rolling over and over on the soft grass. Not for a long time had Bessie had such a pleasant playmate.	99 113 128 142 156 170 183 198 212
They were on the front lawn now, resting a minute after a particularly wild romp. Suddenly, through the pickets of the fence, the dog spied a cat crossing the street outside. Immediately he dashed after her, squeezing between the pickets, and running down the street at top speed. "Here, doggie, doggie," the little girl cried, and ran after her playfellow, only to be stopped by the fence. From between the pickets, she could see both the cat and the dog rapidly disappearing down the street. Hot tears of disappointment welled from her eyes. She hurried to the gate and shook it; it was securely latched. Could she open it? Many times before had she tried, but without success. Little girls grow, however, and standing on the lower part of the gate, and stretching to her utmost, she was just able to press her little fingers against the latch. Click, and the gate swung open. Bessie was free to hurry down the street. The cat and dog had disappeared around the corner of the next block.	225 239 249 261 275 289 300 314 325 337. 353 366 379 386

R. Thorndike Publishing Co. R

English. Test No. 4. Normal Reading

Bessie's (Adventures, Experiences, Story.)

SCORE
Number of Words ——

"Measure the efficiency of the entire school, not the individual ability of the few"

FIG. 1

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ARE TO BE REPRODUCED IN ANY WAY WITHOUT SPECIAL PERMISSION

Name ——— Grade ———

No. of Words

BESSIE'S ADVENTURES. PART C.

Once out of the yard, Bessie ran straight down the street as fast as her 19
two little legs would carry her. From the corner around which the dog and 33
cat had disappeared, she could see, half way up the block of the cross street, 48
a dog barking furiously at the foot of a tree. So Bessie ran in that direc- 63
tion, getting quite out of sight of her own home. When she drew near, 77
however, she stopped running and stood gazing at the dog in dismay. Her 90
cute little playfellow was nowhere to be seen. This dog was larger and 103
darker, and his voice was loud and savage. What big teeth he had! How 117
viciously he growled and snapped at the cat up the tree! 128

Suddenly a sense of loneliness oppressed the little girl The world 139
seemed big and strange; she must get back to her home and her mother. 153
She turned and started to run again, making for the corner. A great auto 167
truck thundered by, blowing its horn loudly. A group of children jeered 179
at her, and a small boy tried to block her way. Bessie reached the corner 194
at last but, confused, bewildered, she turned in the wrong direction. 205

On and on she ran, finding nothing but strange houses and unfamiliar 217
scenes. A suspicion that she was lost flashed across her mind and filled it 231
with terror. The suspicion grew to a certainty. She *was* lost! She would 244
never see her mother any more! In a dumb agony of terror the little girl 259
sank helplessly upon the nearest horseblock, then gave way to a storm of 272
sobs she could no longer restrain. 278

English. Test No. 5. Careful Reading.

SCORE
Number of Words ——

Measure the efficiency of the entire school, not the individual ability of the few.

FIG. 1

or not certain words had been used in the story. Next they were given a third part of the story, but this time were told to read the same carefully, so that they would be able to reproduce what they had read. Again the conditions of starting and stopping were carefully controlled, and the time allowance was one minute. A line was drawn around the last word read. This will be called a test of careful reading. The scoring of the amount of the material reproduced proved long and tedious, and very few data on this point are available. This study will deal wholly with the speed of reading, and it should be clear that this is done, not because quality of understanding *is unimportant*, but *of necessity*. A copy of the material of these two tests is shown in Fig. 1.

Not all the individual scores were returned, so that Table I, giving the median rates per grade, was made up both from 132 class medians

TABLE I

MEDIAN CLASS AND INDIVIDUAL SCORES BY GRADES

GRADE	TEST 4. NORMAL READING						
	Class Scores			Individual Scores			Standard
	No. of Scores	Median	M.D.	No. of Scores	Median	M.D.	
IV	26	165	15	291	161	48	160
V	29	173	32	358	180	52	180
VI	29	215	22	304	226	52	220
VII	26	252	24	256	256	52	250
VIII	20	235	30	163	262	60	280
Adult	2	316	.....	97	317	70	320
Total	132	.....	.....	1,469	.....	.....	.....

GRADE	TEST 5. CAREFUL READING						
	Class Scores			Individual Scores			Standard
	No. of Scores	Median	M.D.	No. of Scores	Median	M.D.	
IV	26	126	20	328	106	36	110
V	29	136	26	364	133	50	130
VI	29	169	30	277	172	44	160
VII	25	188	30	256	178	48	185
VIII	20	205	40	163	200	50	200
Adult	2	172	.....	90	184	58	200
Total	131	.....	.....	1,478	.....	.....	.....

representing about 3,000 children and from the distribution of nearly 1,500 individual scores. The class results, however, agree closely with the medians derived from such individual scores as were secured, and it is probable that these values would not be greatly changed had a larger number of scores been available.

The results of Table I are shown graphically in Fig. 2, and over the heavy line representing the medians of the grade medians has been

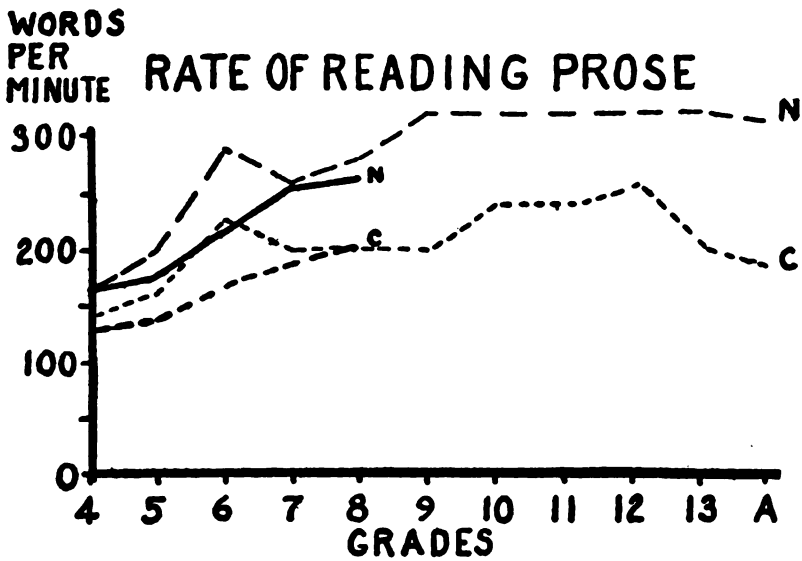

FIG. 2

drawn the record from a single school and from a group of adults. Taking up the class scores first, it will be seen that there is a steady progress from Grade IV to Grade VIII, fairly constant from the fifth grade on. The final value approximates closely the average adult score, if allowance is made for an eighth-grade drop in Test 4.

The curve in light dotted line represents the results from a private school for girls. Note that the curves for both normal and careful reading are irregular, owing to the exceptional performance of the sixth-grade class, but if this class be disregarded, it will be seen that the steady progress through the grades reaches adult speed at the ninth or tenth grade and afterward does not vary widely from these constant values.

This suggests that a value of approximately 320 words per minute for rapid reading and 200 words per minute for careful reading represent adult ability and the general limit of productive training. Ability to scan a passage rapidly and ability to read and understand—to read in order to retain—as developed by direct training, would not need to rise above the limits given. The scores given in Table I may well represent

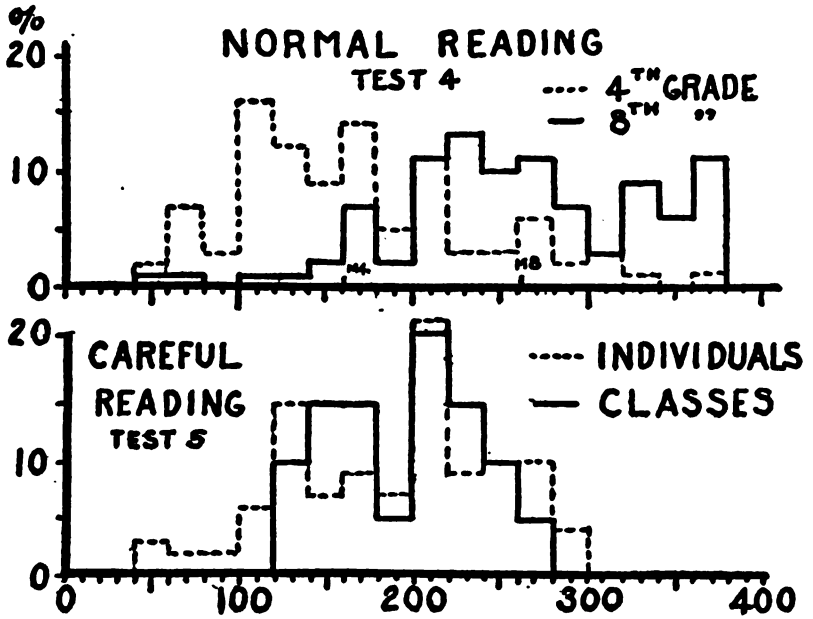

FIG. 3

standard scores toward which to work. The actual standards given in the table were obtained by smoothing the development curves derived from the median scores.

A significant feature of the results is the wide distribution of individual scores and the narrower range of class scores. In Table I compare, in both tests, the median deviation (M.D.) for class medians with that for individual scores. In Table II the distribution of 163 individual scores and of 20 classes, both eighth-grade, are given for comparison.

Fig. 3 shows the comparison graphically. This difference between the two distributions shows that the same conditions exist as in arith-

metic, and that the same forces are at work; in other words, that the most important factor to be controlled in teaching children to read is the factor of individual differences. In Table II, also, is given the distribution of individual scores of fourth-grade children and of adults. Note that even in the fourth-grade median adult speed is attained by a few individuals, while among adults some fall below the median fourth-grade rate. This tremendous range of individual variation is proof that in the teaching of reading the school at present has little control over the product. Experience shows that control is possible if a definite task is set before each child and he is allowed to reach the goal in his own way. The table and the results it expresses make it possible to say that only as standard practice tests are devised which will enable a teacher to handle a group of children, yet let each child grow in his own way and progress at his own rate, can the teaching of reading be made much more efficient than it is at present.

Uses of the standard scores.—The primary value of standard scores has just been indicated: they give the information needed for the construction of standard practice tests, for the development of standard skill in reading. They also serve the teacher as a guide in the assignment of lessons. It is a simple matter to estimate by means of the number of words in a line and the number of lines on a page the length of time it will take to read over once a passage in a textbook. The writer has before him a textbook with approximately 260 words to the page which was assigned for close study by adults at the rate of about 20 pages a day. As each page would require on the average a little more than a minute to read over once; to read the assignment through three times would alone take up the allotted hour of study, to say nothing of the time required for collateral reading, analysis, digestion, and use of the material gained in solution of problems. Reading and reference lessons are too often assigned without regard to the time required to read the material over thoroughly, with a result that children are soon confirmed in the habit of hasty reading without assimilation. Teachers everywhere, following the general method of this study, should determine the average rate of reading of their classes in the various types of textbooks used by their pupils and assign all reference reading with such standard rates in mind.

Diagnosis.—The child whose rate falls below the standard for his class is in need of special assistance. The causes of faulty reading are

TABLE II

Distribution of Individual Scores

	Number of Words Read per Minute																				Total Number of Scores	Median Scores
	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380		
Grade IV—																						
Test 4	...	1	6	21	9	46	34	26	42	14	33	9	10	17	6	7	0	2	1	7	291	164
Test 5	8	27	40	30	45	50	52	19	22	12	14	4	1	4	...	...	...	...	...	...	328	106
Grade VIII—																						
Test 4	...	...	1	2	0	1	2	3	11	3	18	22	17	18	12	5	15	6	9	18	163	262
Test 5	...	...	5	3	3	9	24	12	15	11	27	15	16	16	7	...	...	...	...	...	163	200
Adult scores—																						
Test 4	...	...	...	...	...	...	1	1	4	3	3	8	8	6	9	7	7	6	6	28	97	317
Test 5	2	0	...	2	4	3	19	8	5	9	10	3	5	20	...	...	...	...	...	...	90	184
Class scores, Grade VIII—																						
Test 4	...	...	...	...	...	...	...	...	3	0	4	4	2	4	1	1	0	1	...	...	20	235
Test 5	...	...	...	...	...	...	2	3	3	1	4	3	1	2	1	...	...	...	...	...	20	205

many, not one, and the remedy to be applied differs from individual to individual. The child that has not learned to read a line with but three or four movements of the eyes must be given special training to acquire this necessary habit. The child unable to grasp a strange word needs a different treatment. The child slow in his reaction times will benefit by still a different training. But only as these special types of training are provided will the children showing the different defects be able to profit by the ordinary classroom work to the extent the effort of the teacher would warrant. Standard scores in standard tests serve then to point out the children in need of special individual study by the teacher.

Supervision.—Standard scores are also of value from the point of view of supervision. The superintendent or supervisor cannot tell what is done in a room when he is not present. The temptations to misuse the school time are so many and the difficulties of keeping work evenly balanced so great, that even the best of teachers may vary widely from the course as outlined. Where standard tests are given, however, it becomes possible to express the results of the teaching effort in terms of efficiency, if efficiency be defined as the percentage of the total product that comes up to the standard. If of a sixth-grade class of 50, 20 children prove able to read at the rate of 200 words per minute in a final test in June, while in a similar class of the same type of children 40 are able to read at the given rate, the differences must be sought in the work of the two teachers. The advantages of standard scores are that they both *define the product desired* and *limit the amount of the drillwork*, without in any way interfering with the freedom of the teacher to meet the standards by any method he may wish to use. When superintendents and teachers once appreciate the satisfaction of this means of supervisory control, measurement of efficiency in such terms will be generally adopted.

Suggested problems.—Attempt to reach 100 per cent efficiency. Measure the children at the beginning of the year as to rate of reading in several different materials (that is, rate of reading a story in readers, a reference in history, a lesson in geography, etc.), following the general method outlined above. Work with individual pupils below standard until the standard score is reached. Excuse the able from reading-drill. Measure results at end of year and determine amount of improvement of class and of individual, and compare results with work of another teacher both as to efficiency and as to time-cost.

Use standard scores in determining the amount of material to be assigned in one lesson, checking up on the time spent by the children until the proper length for a lesson is determined in terms of the standard rate of reading. If an eighth-grade child can read at the rate of 200 words per minute and he has ten minutes for study, it would obviously be wrong to assign a reference of 2,000 words to be studied. Experiments seem to show that with one reading a child will be able to reproduce about one-half of the essential ideas. It is quite possible that a reference of 500 words would be sufficiently long. But whatever the proper length, the relation to the rate of reading should be known, and the study of children should be supervised until they are able to "learn" a standard length of lesson in a "standard" time.

Note.—Definition of aim and limitation of training are possible in all subjects and grades, and certain school men in many different localities are actively carrying on the necessary experimentation by which the evolution of new administrative methods is forwarded. For the benefit of those who have not given the matter thought heretofore, the following objective standards are suggested, as those now available for practical school work:

1. Reading:

A child in Grade.....	IV	V	VI	VII	VIII	
Should be able to read simple prose at the rate of.....	160	180	220	250	280	words per minute

and to reproduce 50 per cent of the ideas in a 400-word passage after one reading.

2. Writing:

Handwriting.—A child whose daily penmanship in spelling, English, history papers, etc., is as good as quality 12 of the Thorndike scale (or 60 on the Ayres scale) needs no further direct drill in handwriting.

Rate of writing.—A child should be able to write

An original story (after reflection)
A reproduction of a story read to him } at a rate of

Grade.....	III	IV	V	VI	VII	VIII	
Original story.....	9(?)	12	14	16	17	18	words per minute
Reproduction.....	11(?)	14	17	19	21	23	" " "

3. Composition:

The quality of his story or composition in

Grade.....	IV	V	VI	VII	VIII
Should be.....	45	49	53	58	65

on the Hillegas scale.

4. Arithmetic:

Four operations with whole numbers, using examples like the following:

TYPICAL EXAMPLES

Addition	Subtraction	Multiplication	Division
345 487 631 205 943 683 859 175 794	3479127468 1867396737	4179 36	67)61707

Children in the various grades in the time indicated should be able to work correctly the number of examples in the following table:

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
III	3	4	3	2
IV	5	6	5	4
V	7	8	7	6
VI	9	10	9	8
VII	11	11	10	10
VIII	12	12	11	11
Time allowance	8 minutes	4 minutes	6 minutes	8 minutes

Rule for finding the efficiency of teaching in any topic in which a definite objective aim has been established: Test the entire class under uniform conditions as to time and instruction, using sufficient material of a single type to keep the most able busy during the entire time. Score results on a uniform basis. Determine the number of scores that equal or exceed the standard. Find what per cent these scores are of the total number of scores.

Remarks.—Faulty control of the conditions of testing is responsible for much of the self-deception which now exists among teachers. For instance, it is foolish to judge the efficiency of the teaching of handwriting from samples obtained where the children are simply told to submit samples of their handwriting. The best specimen for judging the writing of an individual is that written as part of the first draft of an original story. Even then, although satisfactory in quality, the

writing should not be accepted as standard unless written at the standard rate for the child's grade. Only as proper speed was maintained, and only as the handwriting in the specimen was fulfilling its proper function (that of recording thought), should it be considered as suitable for measurement of the handwriting training. For many purposes it is enough, however, to control the rate of writing in a dictation exercise. For this purpose the following table enables the dictation to be given at the proper rate:

	Grade					
	III	IV	V	VI	VII	VIII
Number of seconds per letter.....	?	1.2	1.0	0.85	0.73	0.63
Number of seconds per word.....	?	4.3	3.6	3.2	2.8	2.6
Average number of letters per word	?	3.5	3.6	3.7	3.9	4.1

For instance, in dictating the following paragraph to an eighth-grade class in June, a watch having a second hand should be used. When the second hand reaches 60 the first sentence should be said, and because it contains 67 letters the teacher should wait 42 seconds ($67 \times 0.63 = 42$) before saying the next sentence, and so on. The numbers in parentheses show the position of the second hand when the sentence following should be dictated.

(60) The trees are heavy with leaves; and the gardens full of blossoms, red and white. (42) The whole atmosphere is laden with perfume and sunshine. (12) The birds sing. (21) The cock struts about and crows loftily. (43) Insects chirp in the grass, (57) yellow buttercups stud the green carpet like golden buttons, (29) and the red blossoms of the clover like rubies.

Spelling, punctuation.—The time-factor is very important in tests in spelling and punctuation. A correct result, written legibly and easily (at proper speed), is alone to be desired. The dictation exercise above is also a spelling and a punctuation test, but even in the conventional spelling-lesson the rate should be controlled. Illustration (eighth grade):

Time	Word
(60)	which
(3)	separate
(8)	rustle
(12)	receive, etc.

SECTION 3

SELECTED BIBLIOGRAPHY UPON PRACTICAL TESTS OF READING ABILITY

WILLIAM S. GRAY
Department of Education, University of Chicago

The articles are arranged inversely in the order of their publication; that is, the most recent appears first and the oldest appears last.

Schmitt, Clara. "School Subjects as Materials for Tests of Mental Ability," *Elementary School Journal* (continuation of *Elementary School Teacher*), XV, 150–61, November, 1914.

This article discusses the possibility of using reading and other school subjects to form a series of tests which can be used from year to year to measure the development of special abilities. The accomplishment of the child in reading is discussed as to quantity and quality. The methods and results of reading tests for normal and defective children are discussed in detail.

Thorndike, E. L. "The Measurement of Ability to Read," *Teachers College Record*, XV, 207–27, September, 1914.

This article presents preliminary scales and tests for the measurement of achievement in reading along the following lines:

1. A pupil's ability to understand the meaning of words and sentences seen, so far as concerns (*a*) the understanding of words singly, and (*b*) the understanding of sentences and paragraphs. ("A Scale for Visual Vocabulary" and "A Scale for Measuring the Understanding of Sentences and Paragraphs," by E. L. Thorndike.)

2. A pupil's ability to pronounce words and sentences seen in a series of paragraphs arranged in the order of increasing difficulty. ("A Tentative Scale for the Measurement of Oral Reading Achievement," by William S. Gray.)

Brown, H. A. "Measurement of Efficiency of Instruction in Reading," *Elementary School Teacher*, XIV, 477–90, June, 1914.

This article treats of the relation of the measurement of reading ability to the reconstruction of methods of teaching. The factors involved in measuring reading efficiency are outlined, and a practical method of testing reading achievement is given in some detail.

Judd, Charles H. "Reading Tests," *Elementary School Teacher*, XIV, 365–73, April, 1914.

Standards for measuring efficiency in school subjects are defined. The value of comparison between groups undertaking similar work is emphasized. Practical suggestions are given concerning the selection of material for reading tests and concerning the administration of the tests.

Courtis, S. A. "Standard Tests in English," *Elementary School Teacher*, XIV, 374–92, April, 1914.

The six tests used by Mr. Courtis to determine standard rates of reading and to determine comprehension are presented in a single series under the head of "English Tests." The relation of these tests to the measurement of reading ability is discussed.

Pinter, Rudolf. "Oral and Silent Reading of Fourth Grade Pupils," *Journal of Educational Psychology*, IV, 333–37, March, 1913.

The problem discussed is: Is the percentage of subject-matter retained or comprehended increased or diminished by the supposed help of oral reading?

Bowden, Josephine. "Learning to Read," *Elementary School Teacher*, XII, 21–33, September, 1911.

This article reports the results of an experiment to determine how children recognize words.

Hendricks, Eldo L. *A Preliminary Report of a Study in Reading*, Silver, Burdett & Co., 1911.

This pamphlet presents the methods and results of a study of the rate of silent reading and the degree of comprehension in grades I A, IV A, and VIII A.

CHAPTER V

HANDWRITING

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The aim of these reports, as determined by the committee under whose direction they have been prepared, is the determination of the minimum essentials in the subjects of the curriculum which are concerned. In the case of a subject like handwriting, the object of which is the development of skill, minimum essentials are to be considered, not as absolute requirements, but as dependent in a measure upon the time and effort which are required to attain them. It is germane to the subject, then, to consider both the amount of skill which it is desirable that a pupil shall attain from the point of view of the demands of society and of his later life, and also the time which is required in order to attain this skill. The subject, then, may be approached from either side. We may ask, on the one hand, what degree of excellence in writing the pupil should possess in order to be able to meet the demands which will be made upon him; or we may ask, on the other hand, what degree of skill is attainable under specified conditions in the school.

We shall attack the second phase of the problem first, and assume for the time being that a reasonable amount of skill is desirable and necessary for every elementary-school pupil. We shall attempt to define more particularly what a reasonable degree of skill is by the study of the skill which is actually attained by the pupils in a large number of cities in the United States. We shall then further attempt to determine whether this degree of skill will be actually required by the pupil, from a result of a questionnaire sent to various business houses regarding the degree of excellence in writing which they demand of applicants for positions.

In order to obtain a basis upon which to construct a standard of attainment for the pupils in the various grades of the elementary school an investigation was made of the proficiency in handwriting of the children in a number of the larger cities of the United States. The

results of this investigation, which are presented in summary form in Table I and in Chart I, represent the average speed and the average legibility of the writing of the children in each grade from the second

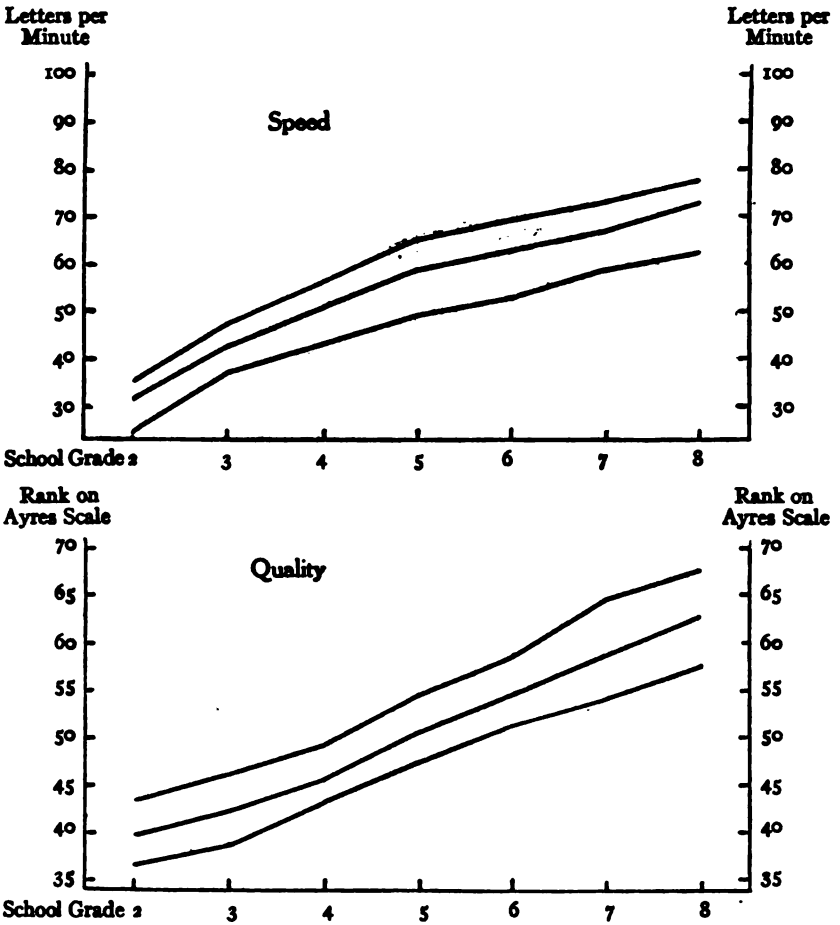

CHART I.—Average speed and quality (middle lines) and average of upper and lower halves in all the schools investigated.

to the eighth. This average of attainment for all the schools is represented by the middle line in each of the charts. In addition to this, the schools were divided into two groups, on the basis of the total efficiency

of the writing from each school. The first group represents all of those who are above the average in attainment, and the second group is the remainder. The upper line in each chart represents the average attainment of the upper half, and the lower line the average attainment of the lower half.

TABLE I

AVERAGE SPEED AND QUALITY AND AVERAGE OF UPPER AND LOWER HALVES IN ALL THE SCHOOLS INVESTIGATED

		SCHOOL GRADE						
		II	III	IV	V	VI	VII	VIII
Speed	Average of upper half...	35.4	47.7	56.2	64.9	69.2	73.4	77.8
	Average of all.....	30.6	43.8	51.2	59.1	62.8	67.9	73.0
	Average of lower half...	24.4	37.4	43.4	49.9	52.8	58.5	61.2
Quality	Average of upper half...	43.5	46.1	49.3	54.5	58.5	64.7	67.8
	Average of all.....	39.7	42.0	45.8	50.5	54.5	58.9	62.8
	Average of lower half...	36.8	38.8	43.2	47.4	51.5	54.2	57.6

A word should be said regarding the manner in which the data for these charts were collected. A questionnaire was sent to the superintendent of each city in the United States of 30,000 inhabitants and over, and in addition to this a request that a test be made in two representative schools of the system. Minute directions for the conduct of the test were given in duplicate form so that one copy might be had by each person conducting the test. The test was to include the measurements of the speed and also of the legibility or the quality of the writing. A measure of the speed was obtained by requiring the pupils to write for two minutes. The number of letters which were written per minute was then taken as the measure of speed. The papers were sent to the writer at the University of Chicago, who had them graded by the members of a class in experimental education.

Fifty-six cities responded to the request that a test be made, and sent the papers in to be graded. Of these papers, 24 were selected at random from each grade of each school. Thus there were 336 papers selected from each school. In round numbers, allowance being made for the fact that papers from some schools were missing, there were about 34,000 papers graded. The average for each grade, then, is represented by about 5,000 papers.

The grading for legibility was done by means of the Ayres scale, since this is presented in a somewhat more systematic form than the Thorndike scale, and since previous investigations indicated that it gave a slightly greater reliability of judgment. The experience which was gained from using the scale in the investigation and an investigation which was made by Mr. H. T. Manuel and presented in satisfaction of the requirements of the Master's degree in the Department of Education of the University of Chicago indicate that the individual measurements must be taken with a large allowance for error. The mass results, however, which are represented in the curve of the average and the curves of the upper and lower halves of the schools represented, may be taken to be reliable, since they are the combined results of the measurements of a large number of investigators. In order that the writing of the children in a particular school or school system may be compared with this standard, it would be necessary that it be examined by several investigators. The grades obtained by a single grader upon a group of papers have one chance in two of being as much as half a step on the scale above or below that which would be obtained by a large group of investigators. Half a step is equivalent to more than the average difference between successive grades.

The upper line in the chart, then, may fairly be taken to represent the legibility and the speed which are attained by the better schools in the larger cities of the country. Care was taken to avoid the possible error due to the fact that some schools might be superior in speed but inferior in legibility, or vice versa. This fact would affect the results if the schools were grouped to obtain the upper half by speed and legibility separately. In this investigation the schools were ranked separately at first, and then a combined rank was formed, and the upper half in this combined efficiency was determined upon. The upper line, then, represents those schools which occupy the upper half in combined efficiency, and the lower line those which occupy the lower half in combined efficiency.

The upper line may be taken as a basis or a starting-point for discussion in the determination of standards for attainment. This places the standard at a point which is equaled or excelled by approximately 25 per cent of the schools of the cities represented, and which is fallen below by approximately 75 per cent of the schools. A standard which is equaled or excelled by about 25 per cent of the schools of the country is

one which is obviously perfectly possible of attainment. It is a standard which is attained under the ordinary conditions of school life. We have no reason to presume that the conditions in these cases are superior to those in the case of the other cities which were studied; or, to speak more correctly, the conditions which have produced the superiority in certain cities over others are such as might be obtained in the cities which show inferior results. Among the conditions which might conceivably produce a superiority in results are: the superior native ability of children; the superior ability of teachers, or superior training; a superior method of supervision or of teaching; and a larger amount of time spent in the study of the subject.

Among these possible causes we may rule out the first, since there is no reason to suppose that the average capacity of pupils in the cities of the country varies to any considerable extent. So far as the efficiency of the teachers or of the methods which are used is concerned, this is a matter which is under the control of the school administration, and if it can be shown that superiority in the results from certain schools is due to these factors the responsibility lies upon the administration to see that it obtains the superior conditions in its own school system. The last factor, that of the amount of time spent, is answered in the results of the questionnaire which was included in the present investigation.

The distribution in time which was spent upon handwriting in the cities which replied to this question is shown in Table II. It is seen from this table that there is a wide variation in this matter. Some cities spend no time in certain grades, or spend upon an average only about 45 minutes per week, while other cities spend nearly three times as much time as this. One city, in fact, spends upon the average five times as much as do two other schools.

The average amount of time spent in the grades taken as a whole does not vary so much as the amount of time spent in each grade taken separately. This is due to the fact that some schools spend more time in the earlier grades and others in the later grades. It is frequently the case that little or no time is spent in the first two grades or in the last two. Three typical modes of unequal distribution appear according as a larger amount of time is spent in the earlier, the middle, or the later grades than in the remainder. The time distribution in a number of cities which represent these types is shown in Table III.

TABLE II

DISTRIBUTION OF TIME SPENT IN TEACHING WRITING IN 66 CITIES

(The figures in the body of the table indicate the number of cities which the amounts of time specified in the margin.)

TIME IN MINUTES	GRADE								AVERAGE OF ALL GRADES
	I	II	III	IV	V	VI	VII	VIII	
?.....	2	1	1	1	1	1	1	2	1
0.....	4	2	.....	.....	.....	.....	1	4	.....
30- 39.....	1	.....	.....	.....	.....	1	1	3	.....
40- 49.....	1	1	.....	.....	.....	.....	6	6	2
50- 59.....	12	10	5	4	2	2	.....	1	7
60- 69.....	3	3	4	5	12	15	20	18	13
70- 79.....	20	22	27	22	22	25	19	17	18
80- 89.....	2	4	4	7	5	4	6	6	13
90- 99.....	1	2	2	2	3	3	8	4	7
100-109.....	16	15	16	22	16	11	2	4	.....
110-119.....	.....	.....	.....	.....	.....	.....	.....	.....	2
120-129.....	2	4	3	1	4	2	1	.....	2
130-139.....	.....	.....	1	1	.....	.....	.....	.....	.....
140-149.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
150-159.....	1	1	2	.....	.....	1	.....	.....	.....
160-169.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
170-179.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
180-189.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
190-199.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
200-209.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
210-219.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
220-229.....	.....	1	1	1	1	1	1	1	.....
230-239.....	.....	.....	.....	.....	.....	.....	.....	.....	1
240-249.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
250-259.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Total no. of cities.	66	66	66	66	66	66	66	66	66
Median.....	74.8	77.0	78.2	81.6	77.9	75.3	71.9	69.2	75.3

TABLE III

THREE TYPES OF DISTRIBUTION OF TIME GIVEN TO WRITING IN THE DIFFERENT GRADES (IN MINUTES PER WEEK)

	GRADE							
	I	II	III	IV	V	VI	VII	VIII
Average of 12 cities.....	96	96	90	80	79	71	67	57
Average of 11 cities.....	53	58	80	90	88	68	55	54
Average of 6 cities.....	43	52	56	65	69	73	74	62*

* Drop due to the fact that one city gives no time in Grade VIII.

The question immediately arises whether the larger amount of time spent by some of the schools enables them to attain a greater efficiency. If so, it would then be necessary to raise the question whether the added efficiency is a justification for the increased amount of time. If, however, it is found that those which spent the larger amount of time do not thereby profit in the efficiency which is gained, the second question does not need to be asked.

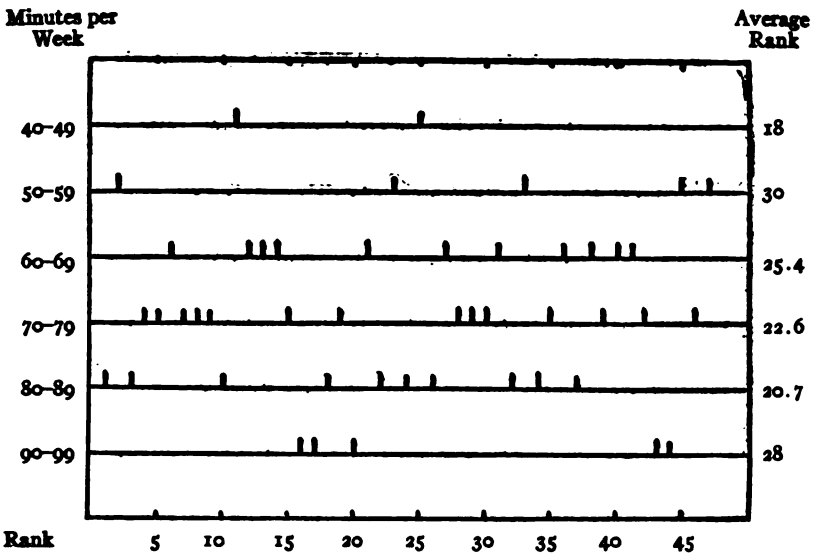

CHART II.—Distribution in rank of 47 cities arranged in classes according to the time spent on writing.

The comparison in the rank of schools which spend different amounts of time upon writing is shown in Chart II. Each vertical line in this chart represents one city. The lines upon the same horizontal line represent the cities which spend the same amount of time in writing. Those on the upper line spend the least amount of time, and those upon the lowest horizontal line, the largest. The position of the lines in the right or left direction represents the rank which was obtained by the schools as a result of the test. Those which are at the left side of the chart are higher in rank, and those which are toward the right are lower.

If the spending of a large amount of time in writing produces a corresponding gain in efficiency, the vertical lines should be grouped

along a diagonal line running from the lower left-hand corner to the upper right-hand corner. That is, those which spend the less amount of time should be toward the right, and vice versa. It is evident that this situation is not represented by the facts. The cities which spend the various amounts of time are scattered throughout the range. For example, of the two cities which spend on the average only 45 minutes per week, one has the eleventh rank and the other the twenty-sixth; while two of the cities which spend an average of 95 minutes have the rank of forty-three and forty-four, very nearly at the bottom of the list. The average rank attained by the cities of each time-group are represented in the column to the right. It will be seen that with the exception of the shortest-time and the longest-time groups there is some increase in efficiency with an increase in time, but this increase, which holds on the average, is slight, and the exceptions are so great that the amount of time spent appears to have little influence upon the results.

Another means of judging the effects of the length of time spent in handwriting upon the efficiency of the product is to compare the amount of time spent by the cities which compose the upper half with those which make up the lower half. When this is done it appears that the amount of time is practically equal. The 23 cities of the upper half spend $73\frac{4}{10}$ minutes per week, and the 23 cities of the lower half, $73\frac{3}{10}$ minutes.

In endeavoring to interpret these facts it is not necessary to assume that the amount of time spent has no effect upon the efficiency of handwriting teaching. It does appear to mean, however, that it is not desirable to spend more than ten or fifteen minutes a day when this time is spent all in one period. The data which are at hand do not give sufficient information upon which to base a conclusion as to the best amount of time to give. Such a conclusion could best be based upon experiments in which different amounts of time were tried out with the same class or with the same school, and with other conditions remaining the same. The conclusion which can be drawn from the data, however, is that the superior attainment of the schools in the upper half of the whole group is not due to spending a greater amount of time in handwriting teaching.

Taking the average attainment of the upper half of the schools, as represented by the upper curves upon Chart I, as a tentative standard or as a basis of discussion, we may look upon them from another point

of view. If we compare the curves for legibility and for speed, we see that the former advances steadily and at about an equal rate from the first grade to the eighth; while the curve for speed advances rapidly up to the fifth grade and then very slowly from the fifth grade to the eighth. The difference in speed of writing between the second grade and the fifth is 29½ letters per minute; while the upper grades on an average gain only 12$\frac{9}{10}$ letters per minute above the fifth grade. This break in the rapidity of advance in speed furnishes a point of attack and raises the question whether it is necessary and desirable.

If we ask ourselves the reason for this difference in the speed and legibility, part of the answer probably is to be gotten from the fact that legibility is more readily tested in the school and that more attention is paid to it than to speed. The permanent result of the child's writing is represented in the quality of the writing, while the rapidity with which he writes is not evident merely upon the inspection of the paper. The teacher will therefore more readily notice and will be more likely to criticize deficiency in legibility than deficiency in speed.

These considerations do not serve to explain, however, why there is a more rapid advance in speed in the earlier grades than in the later ones. This difference may perhaps be accounted for by the fact of rapid increase in motor ability up to the period of adolescence, and the slower increase in ability from that time forward. Chart III shows the curve of progress in rapidity of tapping from an examination of a thousand school children by Gilbert. The parallelism between this curve and the curve showing the speed of writing is striking. If the hypothesis which was presented in the preceding paragraph, then, is correct—namely, that the progress in legibility is more continuous than in speed because the teacher can observe it better and is supposed to criticize this point more than that of speed—it will serve to explain, not why the progress in speed becomes less rapid after the sixth grade, but why the progress in legibility continues while that of speed does not.

We may ask, then, whether the facts as they are presented are to be taken as a basis for the construction of a standard, or whether it is reasonable to expect and demand that progress in speed continue in the same way as does progress in legibility. If such continuation is to be attained, it can be had only by the application of greater stimulus toward speed than is commonly given. That the attainment of a much higher speed in the higher grades is possible without undue effort is shown from

the records of the group of seven schools shown in Table IV and Chart IV. The average amount of time spent by these schools is 73½ minutes, which is not greater than that spent by the other schools which are the subject of this study, and the total efficiency of each is high enough to place it within the highest quarter of all the schools.

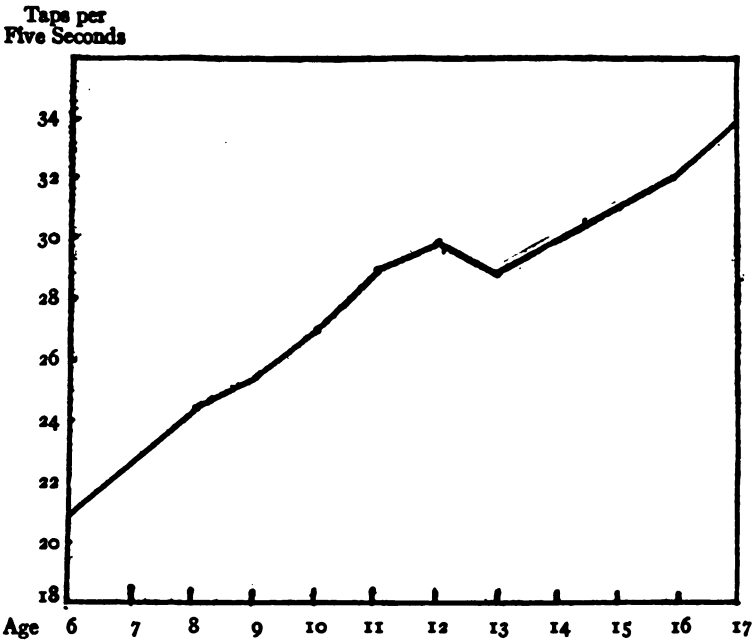

CHART III.—Progress with age in rate of tapping (after J. A. Gilbert, *Studies from the Yale Psychological Laboratory*, 1894, II, 65).

TABLE IV

SPEED OF SEVEN SELECTED SCHOOLS FROM THE HIGHEST QUARTER OF THE WHOLE GROUP IN TOTAL EFFICIENCY

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
Speed.....	45.4	53.1	60.0	68.1	71.7	79.6	94.2

The attainment of these schools indicates that under favorable conditions there may be a falling off in the rate of progress in speed at the fifth grade but that the loss may be made up by the time the eighth grade is reached.. It is therefore not unreasonable to require a more rapid rate of progress from the fifth to the eighth grade, when it is considered from the point of view of the capacity of the pupil. Whether it, as well as the other features of the standards which have been described, is reasonable from the point of view of the demands which will be made upon the pupil we shall have to consider next.

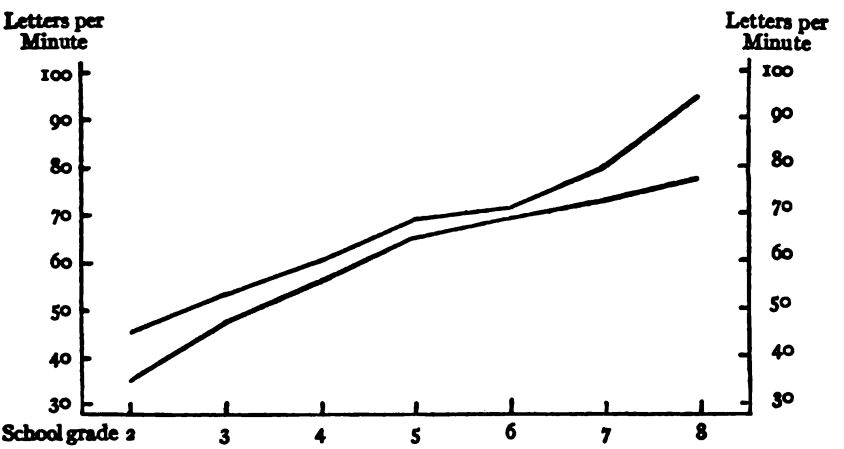

CHART IV.—Average speed of writing of seven schools which are in the upper 25 per cent of the whole group in total efficiency (upper line) and the average speed of the upper half for comparison (lower line).

Table V shows the results of the questionnaire which was sent to various employers of clerical workers asking for information regarding the degree of excellence in writing which they require of the applicants for positions. The firms which are represented are among the largest in Chicago and may be taken as typical of the kinds of business houses which they represent. The results can be taken only as suggestive, since they are limited in the number of cases which were investigated. Taken as a whole, however, they give some basis for drawing the conclusions as to the degree of excellence in writing which pupils should attain at the end of the elementary school.

TABLE V

Summary of Questionnaire

Kind of Firm	Kind of Work	Number Employed	Education Required	Importance of Writing*				Quality of Writing Regarded as Essential†			Quality of Writing Regarded as Desirable			Is Speed Important?
				1	2	3	4	Vertical	Medium Slant	Extreme Slant	Vertical	Medium Slant	Extreme Slant	
Correspondence school	Clerical	15	High school preferred	...	√	...	...	.....	90	.....	.....	90 and should be better	.....	Yes
Department store	Clerical and accounting	19	Grammar school		...	...	...	70	70	60	80	90	90	Yes
Mail-order house	Stenography and bookkeeping	500	High school desirable	...	√	...	...	60	60	60	90	90	90	Yes
Correspondence school	Entry and bookkeeping	30	Grammar school	√	...	...	...	.....	90 or better	.....	.....	90 or better	.....	Yes
Mail-order house	File clerk	400	High school preferred Grammar school	...	√	...	...	60	60	50	80	80	80	Moderately
Department store, wholesale	General	.....	Grammar school at least	...	...	√	...	60	60	70	60	70	70	Yes
Packing company, railroad department	Clerical	90	Prefer high school	...	...	√	...	60	.....	.....	.....	.....	90	Yes
Department store	General office	82	Grammar school	√	...	...	...	70	60	60	90	80	80	Yes
Mail-order house	Addressing	200	Common school	√	...	...	...	.....	80	70	.....	90	90	Yes
Correspondence school	Addressing	75	Common school	√	...	...	...	70	.....	.....	.....	90	.....	Yes

Department store claim department	Clerical	50	Grammar school	...	...	✓	...	30	40	40	80	90	70	No
Packing-house.....	"Distribution"	38	.....	...	...	✓	...	.....	.....	70	.....	.....	.....	Yes
Packing-house.....	"Account sales"	53	High school	...	✓	...	...	.....	.....	60	.....	.....	.....	Yes
Mail-order house...	Stock clerk	100	Common school	...	...	✓	...	60	60	60	80	80	80	Moderately
Total.....	.....	1,702												

* No. 1 represents the highest degree and No. 4 the lowest degree of importance. † In terms of the Ayres scale.

As may be seen from the column which is headed "Education Required," all pupils who have finished the elementary school may enter the positions which are included in this table, although in a number of cases it is stated that high-school education is preferred. The positions which are represented in the table were chosen because it was thought that they would be typical of positions in which handwriting is an important qualification. That this is the case may be seen from the results in the column headed "Importance of Writing." The results of this study, then, will apply to those positions or vocations in which handwriting is an important qualification. We may expect that in the majority of other positions handwriting would not be so important. An inspection of the figures in the table will show that the quality which is most frequently regarded as essential for candidates is that of 60 on the Ayres scale. However, the qualities of 80 and 90 are most commonly those which are designated as being important enough to enhance materially the chances of a candidate. It is a reasonable position to take that the standard set for the preparation of the child should be such that it exceeds the minimum essentials, and at least comes, in some degree, toward the maximum quality which would be of value to the pupil. The standard of 70 for the eighth grade is not high from the point of view of the demands of these kinds of work. The results expressed in the last column indicate that practically all of the employers of labor in cases in which handwriting is an important element regard speed as of importance. It was not thought practicable to attempt to obtain more definite statements regarding the degree of speed which is attainable, owing to the fact that the men to whom the questions were addressed would not in all probability be able to express their standards in more definite terms.

A further fact which should be considered in the determination of this question is the number of children who will find it necessary or advantageous to possess the degree of skill which is to be adopted as a standard. To throw some light on this matter we may consider both the future educational and the future vocational careers of elementary-school pupils. Professor Strayer, in his article on retardation, in the *Cyclopedia of Education*, estimates that 35 per cent of the school population reach the high school. A fluent and legible style of writing will be very advantageous to these pupils in their school work. In fact, they will find it desirable to write more rapidly than 90 letters a minute and

the quality of their writing may be expected to deteriorate rather than to improve, unless they receive additional drill.

TABLE VI

VOCATIONAL DISTRIBUTION OF THE FATHERS OF ELEMENTARY-SCHOOL CHILDREN

Unskilled laborers	4 per cent
Semi-skilled laborers and machine operatives	22 "
Artisans and industrial foremen	40 "
Clerks and salesmen	9 "
Managers, superintendents, and proprietors	21 "
Professional and financial	4 "

Light is thrown on the question as to the number of elementary-school graduates who will require a fluent and legible style of writing in their vocations by a table which Dr. Ayres gives[1] showing the vocational distribution of the fathers of elementary-school children (see Table VI). It seems clear that the members of the last three groups, which comprise 34 per cent of all, will find it to advantage to possess the degree of skill attained by the upper half of the schools. A considerable number of the artisans and industrial foremen also make large use of writing. If we add half of these to the last three groups, we get 54 per cent.

There is of course a large duplication between the two groups, those who go to high school and those who have use for an efficient writing habit in their vocations. But some of the latter do not go to high school, and it is probably safe to increase the percentage of those who are affected to something over 60 per cent of the population. This 60 per cent of the population who will need to possess an efficient writing habit includes practically all who complete the eighth grade, since the percentage of the pupils who complete the grades is the same—60 per cent, and since nearly all those in the occupational groups which have been included will have completed the elementary school. Therefore practically all of those who would be required to reach the proposed standard will have need for it in their later life.

The foregoing facts and discussion have been brought together into a standard which is expressed in Table VII and in Chart V. The upper

[1] L. P. Ayres, "Some Factors Affecting Industrial Education," *Elementary School Teacher*, XIV (1913), 313–18.

line in the chart shows the standard for quality, which is to be read by referring to the figures in the left margin; and the lower line represents the standard for speed, which is to be read by reference to figures in the right margin. The standards are based directly upon the results of the average of the upper half of the schools. The only important modification is that in speed from the sixth to the eighth grades. The justification for this modification has already been suggested. In brief,

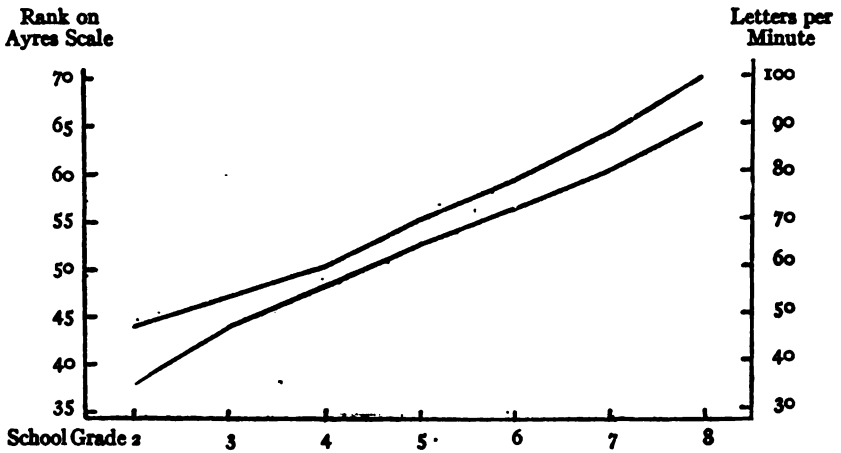

CHART V.—Proposed standard for quality (upper line) and speed (lower line).

TABLE VII

PROPOSED STANDARD FOR QUALITY AND SPEED

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
Quality	44	47	50	55	59	64	70
Speed	36	48	56	65	72	80	90

it is this: While the diminution in the rate of increase from the fifth grade on is a natural one, and is to be explained by the lower rate of increase in motor ability at this time, yet the efficiency which has been attained in a number of schools shows that the drop is not necessary. Furthermore, the actual speed which is attained even in the upper half

of the schools by the time of the eighth grade is lower than it should be. Less than 80 letters a minute is slow writing, and the standard which is laid down, of 90 letters per minute, is well within the bounds of reason. The only other modifications which are made consist in slight changes of the averages found in order to make the numbers round numbers, and to smooth very slight irregularities in the curves. The greatest change consisted in slightly raising the standard in quality for the eighth grade, so as to bring it up to 70 instead of $67\frac{8}{10}$. This maintains an even progress; whereas the results from the averages show a drop at the eighth grade.

The data which have been presented indicate that this standard can be attained with an expenditure of time of not over 75 minutes a week. The writer is convinced on the basis also of some of the data that it could be attained generally, as it is in some cases, by the expenditure of a much shorter amount of time. When the most efficient methods are employed it will probably be found that the expenditure of from ten to fifteen minutes in the intermediate grades suffices to fix the handwriting habit in its main outline; and that the expenditure of a small amount of time in the upper grades will maintain the efficiency of the habit and increase it by the amount of progress which is represented in the standard. The consideration of these matters, however, is not a part of our task. A fuller discussion of them may be deferred to some other occasion.

CHAPTER VI

SPELLING

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MINIMUM CONTENT

Many attempts, unintelligent, or at least haphazard and unscientific, have been made to abridge the spelling course. Teachers have tried to select words from the different subjects in the curriculum or from the spelling texts. While such effort is commendable, it has failed to secure good results because of the fallibility of individual opinion regarding the most important material.

Even among teachers of the same grade there is wide difference of opinion as to what the essential minimum should be. An attempt on the part of the writer to make a graded vocabulary for the elementary school secured words of much too great a range of difficulty for each grade. Only consistent and extensive investigations under skilled supervision will secure adequate results.

The work of several investigators in this field is very commendable and should be more widely known to school men.

Only a few spelling books can be mentioned. *Hicks's Champion Spelling Book*, which has been used so successfully in the Cleveland, Ohio, public schools, is based on the excellent spelling instruction and the experience of teachers in that system. It presents a minimum of ten words per day, two of which are "dominants," and is arranged in such a way that each word is reviewed five times in two years after it is learned, an important factor in the learning process.

The *Bailey-Manley Spelling Book* contains a comparatively small vocabulary chosen with great care; it is an outgrowth of actual teaching experience. It recommends the use of words which every child should know, supplemented by a list based on class or individual needs. Nine words a week are assigned for the second grade, with a gradual increase as the pupils advance.

Dr. Rice's speller has some good features. It attempts to grade words according to difficulty and to give the most common ones precedence; uncommon, i.e., technical terms, are to be taught incidentally. He has attempted to abridge the text by omitting words which "spell themselves," "derivative words formed according to rule," and words whose spelling the pupils learn by the time their introduction is necessary. The number of words per lesson is high; fifteen to twenty for the first three years, and fifteen to twenty-four for the fourth through the eighth.

Professor Jones, of the University of South Dakota, has summarized the results of several years' work in his *Concrete Examination of the Material of English Spelling*[7]* and *The Child's Own Spelling Book*.[8] The content of these two works was established by an examination of over fifteen million words in the themes of 1,050 school children. The list of 4,532 words used in the speller is not a minimum one because it includes for each grade all words which were used by at least 2 per cent of the pupils of the grade. The following table shows the distribution of words and also the average vocabularies by grades:

	Grade						
	II	III	IV	V	VI	VII	VIII
Distribution	1,927	2,396	2,838	3,270	3,695	4,114	4,532
Average vocabulary	521	908	1,235	1,489	1,710	1,926	2,135

Professor Jones says that the most troublesome words are found in the second- and third-grade lists and "faithfully reappear throughout the subsequent years. Over nine-tenths of all words misspelled by the 1,050 grade-students are found in these two lists." The writer has checked up the "one hundred spelling demons" of the Jones list, and finds that ninety-two of them are included in the second-grade list, four in the third, and four in the fourth. This shows where a great deal of the emphasis in spelling teaching should be placed.

The list omits many common names; it includes words having a purely sectional significance; those which are just coming into use, such as "aeroplane"; and those which are disappearing, as "surrey" and "phaeton." This suggests the need of a constant, careful revision of

* Numbers refer to bibliography.

spelling material with a view to giving the child only such words to learn as he will actually use.

Professor Jones's study shows that the child's writing vocabulary is very small as compared with the whole vocabulary. Dr. Ayres's study of *The Spelling Vocabularies of Personal and Business Letters*[2] supports this idea; in fact his investigation found that only 542 different words were used in the greater part of the correspondence from twelve different sources differing as widely as love letters and business letters.

The learning of the words of the writing vocabulary should be required as the pupil advances through the grades. What we need is to develop a spelling consciousness that will make the pupil more awake to orthographical errors, and a conscience that will not permit him to leave a word until he is sure that it is correct. Probably such a condition would result, not only in better spelling, but also in better composition.

Mr. Homer J. Smith[4] has three lists of 1,138 spontaneously used words chosen from 75,000 words in the themes of Madison, Wisconsin, elementary-school pupils, Grades III–VIII. The first list includes words used by pupils in all of the grades; the second of words used by at least three; and the third of words used in two different grades. It can be seen that the basis of selection is universality of use. While the list looks good, it would be more usuable if carefully graded. It omits personal, demonstrative, and possessive pronouns; numerals; about thirty common prepositions, conjunctions, verbs, and adverbs; and local proper names. These omissions constitute a weakness except for the local names, which need not be included except in a purely provincial list.

Chancellor's list[3] of 1,020 words, compiled from his correspondence, is, to quote the author, composed largely of "words that constitute the machinery of our language." It contains no proper names or "words for spelling matches."

Mr. R. C. Eldridge,[6] a factory manager of Niagara Falls, New York, has compiled a list of 6,002 words, together with their frequencies, from two pages of each of four Buffalo, New York, daily papers. The list was prepared to serve as the basis for a "universal vocabulary"; it is of great value as a spelling list, although somewhat specialized. According to Mr. Eldridge the first 250 words are found to constitute the chief English sentence-forming words. "The first 750 words in List 5 [the

compiled list], with their repetitions, constitute more than three-fourths of all the words on the eight pages from which they have been drawn, and probably a large part of these words would be found in nearly the same proportion in any English conversation or printed matter."

Appended to Mr. Eldridge's work is a list prepared by Rev. J. Knowles, of London, England, of "the 353 most frequently occurring words in an aggregate of 100,000 words, made from passages of the English Bible and various authors, arranged in the order of their commonness and showing how many times each of the 353 appears."

Another graded list for Grades III–VII, inclusive, is a compilation published in the Chico, California, State Normal School *Bulletin No. 7*, "Common Essentials in Spelling,"[14] prepared by Messrs. C. K. Studley and Allison Ware. This work includes the 542 words of Dr. Ayres's study;[1] it makes use of an 840-word list—each word was used more than twice in 19,288 words of correspondence examined—prepared by Miss Effie McFadden and Dr. Frederick Burk, of the San Francisco, California, State Normal School. Finally, the authors examined 200,000 words in children's themes in which "3,459 different words or different forms of the same words" were used. "Words not clearly of common written use in life were omitted in the final compilation." The total number is 3,470—over one thousand fewer than are found in *The Child's Own Speller*.

Mr. Algar Woolfolk in an unpublished thesis[19] gives a list of 411 words which "are suitable for incorporation in a text or course of study." The words—only those misspelled four or more times are given—were taken from a miscellaneous set of compositions "consisting of one-third letters" written by pupils in Grades III–VIII, inclusive, of the Horace Mann School, and the public schools of Newark, New Jersey, and Richmond, Virginia. It is valuable because (1) it contains common words and (2) shows the relative frequency of misspellings by grades.

None of the lists is claimed to be a "minimum list"; any one of them is very suggestive as a starting-point. Dr. Ayres's 542 words constitute about seven-eighths of all the words used in the correspondence investigated; the first 750 words of Mr. Eldridge's list constitute, in the author's opinion, about three-fourths of all the words commonly used; Professor Jones's second-grade list "contains the very useful words of all the grades";[7] in the list prepared by Dr. Burk and Miss McFadden only 840 of a total of 6,916 words were found to be used

more than twice, and these "included and verified most of the words of the Ayres list."[13]

On the basis of investigation up to the present time, the writer feels justified in placing the minimum content in the elementary spelling course at from 750 to 1,000 words. Considerable checking of lists against each other, further study of the frequency of words used in children's written work, and a careful trying out of the resulting list in its tentative form will be necessary before any very definite conclusion can be drawn.

Some of the words common to all of the lists offer no real difficulty and might be omitted from a "minimum" list; doubtless further investigation would show some additions to be necessary. Just what changes should be made can be determined only by testing the ability of pupils in successive grades to spell the words and use them in sentences. The words left after such a revision would constitute a fairly reliable minimum.

The writer has examined over 250 city-school reports and courses of study to find to what extent they consider the matter of content. The great majority of them treat the subject in a purely perfunctory way, stating the amount that is to be done each month or year in lessons or pages of a certain text. About sixty of the courses give somewhat more definite information, but few offer anything of real value.

Four courses definitely recommend as high as ten to fifteen words per day; five say that from two to five should be learned; two require from six to twelve. Three courses give instructions to use the adopted text with certain specified omissions.

Of the few cities giving definite numbers of words as the requirement for the whole course, Berkeley, California (1914–15), recommends a minimum of 4,700 for Grades II–VI; New York City[15] recommends 3,800 for Grades II–VIII; Richmond, Virginia (1914), 3,250 for Grades II A–VII B; Bath, Maine (1914), 9,300 for Grades I–VIII.

A publication, *Teaching of Spelling*, issued by the New Jersey Department of Public Instruction, recommends four or five words for a primary lesson, five to seven for an intermediate grade, and not more than ten for a grammar grade. Triweekly lessons for six years on this plan, it is maintained, would give the working vocabulary of a well-educated adult and leave ample time for review. This would give approximately 4,000 words.

Lists of words for Grades I and II are given in the courses of Dover, New Hampshire (1912); Passaic, New Jersey (1912); Augusta, Georgia (1913); Albert Lea, Minnesota (1914); Omaha, Nebraska (1911); Milwaukee, Wisconsin (1913); and Toledo, Ohio (1908–11). Dallas, Texas (1912–14), and Des Moines, Iowa (1909), give lists for the second grade. Orange, New Jersey (1908), and Owensboro, Kentucky (1912–13), give lists for the first grade. Cincinnati, Ohio (1912), has lists for the first, second, and fifth grades. The Johnstown, Pennsylvania, *Report and Manual* (1914) mentions a spelling book compiled by teachers and supervisors which provides two words daily for Grades I–IV, and five daily for Grades V–VIII.

Doubtless there are other lists, but they are not available for the purposes of this paper. Certain definite standards for the selection of spelling words are necessary. They should be symbolical of the experiences of the children in and out of school; they should be words which the average adult uses; they should be the short, simple, frequently used, and perplexing words, such as "their" and "there," "whose" and "who's." Various texts should contribute to the list. Words misspelled by a number of the pupils in a class should be included. Individual pupils should keep lists of words which cause them difficulty. These are substantially the standards set forth in *Standards in Spelling*,[15] a study by Associate Superintendent Gustave Straubenmuller, of New York City. A number of schools are making use of these or similar standards in the selection of their spelling material.

The function of spelling is to teach children how to spell and use in an accurate way the words which are commonly met with in life and to form such habits of study that new words will be learned as the need for them arises. In the preparation of a spelling list the function which it is to subserve should be kept clearly in mind. Dr. Ayres found that of the 414 words used in the famous National Education Association spelling tests of 1908, only 125 were included in the letters analyzed for his study, while not one of the remaining 289 appeared even once. This at least suggests the futility of preparing a useful list of spelling words without careful and extensive study of the needs of the common people.

MINIMUM TIME

Very little of value concerning this topic can be gleaned from pedagogical literature. Our consideration of the topic will necessarily involve a discussion of method, with which it is so intimately associated.

The first investigator of note was Dr. J. M. Rice,[13] who concluded that more than fifteen minutes per day devoted to spelling was absolutely wasted. Dr. Rice's experiments were too crudely empirical to receive serious attention from scientific investigators, but he did much to call attention to the spelling problem. We can have little disagreement with his general conclusion regarding time. The law of diminishing returns would operate here; on account of fatigue, the amount of time spent above a certain limit would be out of all proportion to the results obtained.

Dr. Cornman's experiments[14] in Philadelphia to determine the relative merits of the "incidental" and "drill" methods of teaching spelling led him to conclude that time devoted to drill "bears no discoverable relation to the result."

Mr. Wallin's study[15] of conditions in the Cleveland, Ohio, schools, while not concerning itself directly with the problem of time, showed "on time" pupils to be superior to "accelerated" or "retarded" pupils. He calls attention to three steps in the learning process whose use cannot fail to save time: (1) a clear image of the word, visual, auditory, or motor, should be formed; (2) enough repetition in the child's own memory type should be had to fix the word in mind; (3) the procedure in one and two should be so effective that the word can be reproduced automatically, when the proper stimulus arises, with the minimum thought as to sequence of letters. He says: "Habits perhaps can never be made as stable as reflexes. Nevertheless it can be confidently affirmed that those habits which have been thoroughly ingrained will resist decay longer than those which have been only partially solidified or which have been loosely organized by slipshod methods. A completely formed habit is relatively if not absolutely stable." Stable habits mean economy of time.

Let us consider briefly what city-school reports and courses of study have to offer on our problem. Only forty out of several hundred examined give time apportionments for the several elementary-school subjects. Determination of the time devoted to spelling is complicated by several factors not easily controlled: (1) In the primary grades there is seldom anything to indicate whether the study of phonics occupies a part of the spelling period, or whether spelling is taught with reading. (2) There is little to show whether the time is devoted entirely to recitation, or to recitation and study. (3) Very few courses indicate whether spelling is

to be studied during special periods, or out of school. (4) The fact that courses of study are not issued yearly prevents any very definite conclusions regarding the relative amounts of time devoted to spelling in the past and present.

In the "early days" the time devoted to spelling in Pictou, Nova Scotia, ranged from 74 per cent of the total time for the primary grades to 25 per cent for the grammar grades.[21] This condition was probably fairly typical for the schools of that period. Multiplication of courses has necessitated a readjustment. In 1877–78, 8.47 per cent of the school time in Cleveland, Ohio, was devoted to spelling.[28] During the year 1907–8, the elementary schools of Boston, New York, Chicago, Rochester, Cincinnati, Indianapolis, St. Louis, Milwaukee, Kansas City, and San Francisco devoted an average of 7.22 per cent[29] of their time to spelling. Cleveland's time for the same year was 5.94 per cent.[29] Cleveland's record has become proverbial; the intensive study of only two new words per day makes possible a high degree of efficiency with a minimum outlay of time.

The average time devoted to spelling in eleven other, smaller, cities at practically the same time (1907–9) constituted 5.05 per cent of the total time for all subjects; the percentage for the period 1910–12 for thirteen school systems, including Cincinnati, Cleveland, and San Francisco, mentioned above, was 6.96; for a group of nineteen cities (1913–15), including one of the "eleven" group and three of the "thirteen" group, the percentage was 5.58. Figures showing the percentage of time devoted to spelling over any considerable period are not available for a large number of cities. The few that can be found simply confirm what the above figures show, that the spelling time is gradually being reduced.

EXPERIMENTAL INVESTIGATIONS OF METHODS

A series of experiments[31] was performed by Mr. H. C. Pearson in the Horace Mann School to determine the relative efficiency of class and independent methods of study in improving the child's attention, ability to select the points which need emphasis in study, and drill technique. The former method was proved much better from the standpoint of time and efficiency.

Another experiment[30] of Mr. Pearson's, repeated in one of the Montclair, New Jersey, schools, to determine the relative efficiency of

"together" and "separate" methods of teaching homonyms, proved the former to be more effective on the whole.[1]

The idea of grouping words, i.e., names of rivers, trees, cities, and the like, to facilitate learning, has been adopted by many spellers. While such a scheme may be an aid to learning the names of the associated things, it cannot be of great value as an aid to learning spelling.

Many words in the English language can be classified roughly in *groups of similar spelling*. The remainder, which are exceptions to general rules, are amenable to special study. Wagner's study[11] of the benefits to be derived from grouping words according to similarities in spelling showed a decided advantage for the grouping method. Two divisions of the sixth grade studied a list of words after their customary fashion. The only difference in the procedure of the teacher lay in the grouping of such words as "lineal," "lineament," "linear," "lineage," for one division. These pupils raised their average grade from 68.36 per cent in the preliminary test to 97.14 per cent in the final, a gain of 28.78 per cent. The other division raised its average from 73.25 per cent to 93.6 per cent, an increase of 20.35 per cent.

In 1912 the writer performed an experiment[12] to determine the value of "spelling the word through" as an aid to learning. Two divisions of the fifth grade studied the same list. Conditions as to time, length of period, and the like were the same for both divisions. For one, emphasis was placed on observing carefully the order of letters while studying. Preliminary and final tests given to both divisions showed an advance from 50.55 per cent to 83.39 per cent, or an average gain of 32.84 per cent for the division working under the usual conditions. The other division advanced from 48.58 per cent to 89.14 per cent, an average gain of 40.56 per cent.

A study of all the available experimental material in spelling shows that a consistent use of some definite method secures better results than the so often haphazard methods of many teachers. It simply confirms the opinion of the writer that a study of the question of time which does not consider method is inadequate.

SCALES FOR MEASURING SPELLING ABILITY

Some sort of a measure for spelling ability would result in economy of time by making possible a more accurate diagnosis of the situation and more intelligent methods of treatment. Dr. Buckingham has fur-

nished a scale.[a] At first it made use of two lists, each containing twenty-five carefully selected words "which showed reasonably regular increase in correctness of spelling for successive grades." By means of this scale a comparison can be made of individuals, grades, schools, and systems. By the use of groups of equally difficult words, progress over a period of time can be measured. Dr. Buckingham has extended his list to about 500 words and plans to have 1,000 carefully evaluated and classified words for Grades II–VIII, inclusive. Such an extension will make the scale infinitely more useful.

The Division of Education of the Russell Sage Foundation "has conducted studies to discover the 1,000 words most commonly used in writing and it has made these words into spelling lists with which children in nearly 100 American cities have been tested."[26] These words will doubtless prove valuable in the preparation of a "minimum" list. Dr. Ayres has used them as a standard by means of which he has made a practical test of the spelling ability of Springfield, Illinois, elementary-school children. In this city 3,612 pupils in all grades averaged 70 per cent correct in spelling words which were spelled correctly by 70 per cent of the pupils in the same grades of the cities mentioned before.

CONCLUSIONS

Any conclusions must necessarily be merely tentative, because of the inadequate material at hand and the lack of thorough testing of results. It can be confidently asserted that spelling texts furnish neither a minimum nor, for the most part, a satisfactory list of words. The two texts based on a study of children's themes and on children's themes plus business letters seem most adequate.

Lists of words prepared by Ayres, Chancellor, Eldridge, Knowles, Jones, Smith, Woolfolk, and Studley and Ware afford material from a variety of sources. The words which they agree on might be taken, temporarily, as the minimum content in spelling. A more thorough study of children's writing vocabularies is needed to show (1) what words presenting "no difficulty" may be omitted, and (2) what important words should be added. Each word must be carefully graded; it should be placed in any grade list only when a study of the conditions underlying its use seem to justify its position.

The fact that there are only thirteen city lists, in no case for all grades and none "minimum," shows the need of a work such as is indicated here.

As to time, we know very little. The tendency in the past has been to devote too much time to spelling, because of poor organization of material and inefficient methods of instruction. The problem of time is inseparable from that of method. The figures available show that the time devoted to spelling in city-school systems has been gradually reduced until now 82 minutes per week, or 5.5 per cent of the total, is devoted to spelling.

One investigator has prepared, and another is preparing, graded lists which will be very suggestive as to content, and which may be used as standards for the measurement of spelling efficiency, and for finding how the time devoted to spelling has functioned in securing adequate results.

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CHAPTER VII

THE ESSENTIALS OF COMPOSITION AND GRAMMAR

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INTRODUCTION

Purpose of the paper.—In the present state of knowledge no one is justified in stating with any attempt at completeness what should constitute the essential as contrasted with the optional subject-matter for the study of English composition and English grammar in the elementary school. The topic is as difficult as it is important.

The present paper is a survey of progress. It reviews the discussions, investigations, and reports in this field and offers a summary of conclusions that seem fairly well established. Much remains to be done. Those who wish to press the investigation further will find in the experience of others suggestions as to problems and methods. Meanwhile, course-makers and writers of books should consider the possibility of omitting much traditional material and of placing greater emphasis upon certain activities that are highly necessary in preparation for life and that are at the same time fitted to assist the growth of children.

A general view of the problem.—One reason why economy in English proves difficult is because language forms so intimate a part of life. Improvement in it involves the whole round of home and school interests. Composition is, in a sense, a phase of all study and of all human relationships, rather than a subject to be set apart on the school program for a certain hour in the day. Mastery of it is, therefore, in large measure dependent upon the entire organization and management of the school. Nor can we stop with the school. In the matter of speech—and indirectly writing is deeply affected—the influence of the home is paramount. Other considerations aside, the home has six years the start of the school, the six most impressionable years. Hence the teacher of language, instead of introducing children to a new interest, is called upon to take stock of the language habits already acquired, strengthen and improve

these as she can, and strive to keep the child's power of expression abreast of his ideas. In the end the language he speaks will be mainly the language he has heard.

It is not likely that the time devoted to language in the elementary school can safely be cut down. We must make vast improvement, at any rate, before this will be justified. At present classes are too large to permit of proper individual instruction, methods of teaching and of co-operation are largely ineffective because unvaried and untested, and the work of each year is so ill defined that emphasis is scattered and fails to strike home. What we must aim at is (1) to discover standards which will enable us to decide what to include and what to omit from the language course; (2) to organize and present the chosen material so as to give it continuity, proportion, and a sense of realness; (3) to set up definite goals of achievement, which will stimulate to endeavor but not unduly narrow the path; and (4) to work out measurements which will enable both teacher and principal to know the true state of the pupils' minds.

Present practices are justified mainly by tradition. "It has been so." The very conception of course of study is in need of overhauling. The term means generally an outline of certain formal knowledge to be acquired rather than a series of related experiences leading to the control of consciously prized values. The English course began with a grammar for foreigners modeled on the Latin, was given a new direction by Lindley Murray, but still consists largely of "exercises" made with scissors and paste. How hazy we are on the subject is attested by the fact that language-books, with few exceptions, are a hodgepodge of composition lessons, spelling, forms to avoid, pronunciation, voice-training, picture-study, poetry, scraps of classic prose, lessons in other school subjects, and much formal grammar. It would be a positive gain if the really strong teacher could have for a while the help of a multigraph and be left to work out her own salvation without the interference of the irrelevant book.

THE EDUCATIONAL BASIS

Economy in language-training is an educational problem. It must be studied in the light of general educational principles. Before passing to the survey of actual investigations, let us pause long enough to call to mind some of the more significant attempts to analyze the nature and

purpose of school work with reference to possible omissions from the course and better organization of effort.

One of the most suggestive statements of the problem of economy is that made by Frank M. McMurry, of Teachers College, Columbia University, at the meeting of the National Education Association in 1904.[1] He proposes to eliminate:

1. Whatever cannot be shown to have a plain relation to some real need of life, whether it be aesthetic, ethical, or utilitarian in the narrower sense.

2. Whatever is not reasonably within the child's comprehension.

3. Whatever is unlikely to appeal to his interest; unless it is positively demanded for the first very weighty reason.

4. Whatever topics and details are so isolated or irrelevant that they fail to be a part of any series or chain of ideas, and therefore fail to be necessary for the appreciation of any large point; this standard, however, not to apply to the three R's and spelling.

He would secure economy by judicious selection of topics and details. Teachers must learn (1) to bring subject-matter under large but definite headings, (2) to select typical subtopics, and (3) to discover in each subject leading questions that need to be answered. What is required is better organization of each subject.

Another highly suggestive discussion of the problem of selection and organization of subject-matter is that contributed by A. Duncan Yocum, of the University of Pennsylvania, to the program of the Department of Superintendence at Philadelphia in 1913. Mr. Yocum seeks a test of the relative worth of details in the course of study that shall be both universal and practicable. "To be universal it must measure usefulness, not only from the standpoint of direct preparation for life or social efficiency, including specialization and culture, but also from that of general knowledge and mental development." Here Mr. Yocum seems to favor two of the standards which Mr. McMurry rejects. He would guard these, however, by reducing the test to a "naked definiteness" that would make selection certain through an analysis of the educational aim and the educative process.

This he proceeds to do by dividing all school discipline into phases of formal self-activity, the values of which are to be measured in terms of relationships, and concludes that—

[1] Frank M. McMurry, "What Omissions Are Advisable in the Present Course of Study, and What Should Be the Basis for the Same," *Proceedings of the National Education Association*, 1904.

those details are relatively most useful in their furtherance either of a specific phase of the educational aim or of the formal phases of mental development: (1) which are most many-sided in their relationships; (2) which are most frequent in their recurrence; (3) which inherently make the strongest sensational or emotional appeal that is useful. Relative many-sidedness, recurrence, and emotional appeal should determine the educational content. But to relative usefulness must be added immediacy of many-sidedness, recurrence, and emotional appeal, in order to determine the point at which the most useful details shall first be taught.

Such a test, Mr. Yocum holds, furnishes a definite and mathematical means of expressing value. The number and recurrence of relationships can be counted and the degree of emotional appeal estimated. This, however, will rarely be necessary. It will usually be sufficient to determine what details must be included in the general course of study and which of these must be permanently mastered. Once such details have been determined they must, in the interests of democracy, be thoroughly taught to all pupils.

It is well to take up a survey of specific investigations and formulations of standards and tests with these larger views of our problem fresh in mind. Otherwise our enthusiasm for definiteness and the promise of order where there is now much confusion may mar our perspective. A ready-made course of study on a quantitative basis which teachers could follow without thought would be no less a curse because it had a new name. Behind the machinery of economy must stand far-reaching and rational ideals.

A SURVEY OF INVESTIGATIONS

I. TESTS AND SCALES IN COMPOSITION

1. *The "Tatters" report.*—One of the earliest attempts to measure the effectiveness of school work in English was made in Chicago in 1905 under the direction of Mr. E. G. Cooley, then superintendent of city schools.[1] Somewhat persistent criticism of the results of the grade work in grammar, composition, and spelling led Mr. Cooley to undertake a test of the pupils in the seventh grade. He appointed a committee of principals and teachers, with the writer as chairman, to devise a test and examine the results. The outcome was distinctly favorable so far as the current criticisms were concerned, but not flattering in

[1] Described in the *Chicago Board of Education Bulletin* of March 28, 1906.

respect to other matters which seemed to the committee of greater importance.

The procedure was as follows: A brief story entitled "Tatters" was taken from the *Youth's Companion*, duplicated, and sent to each school in the city. The directions were:

(1) The story is to be used as an exercise in reading and reproduction. Time, one hour. No knowledge of the story is to come to the pupils previous to the time of the exercise.

(2) The story is to be read to the class by the teacher—seven minutes. The story is then to be read silently by the pupils—five minutes. After the story leaflets have been collected, the pupils will silently recall the story—three minutes. The pupils will then write the story—forty-five minutes. Collect the papers promptly.

(3) The teachers will mark the papers and afterward the principal will review the marking. In case he should differ as to any marks, he shall consult the teacher and reach an agreement.

There followed an outline of the main incidents of the story and suggestions as to what would constitute excellence to the degrees of 85, 95, and 100 per cent.

The examining committee prepared an outline to guide each member in reading and reporting upon a portion of the papers. The main points in this were (1) external form, (2) thought and composition, (3) vocabulary and sentence structure, (4) individuality, and (5) general suggestions. The complete report of the committee was arranged under these heads and was accompanied by typical compositions representing different degrees of excellence—a rough scale. There was no attempt at exactness, but the qualities of composition to be sought were definitely indicated. It remained for Professors Thorndike and Hillegas to lead the way in the making of composition scales by means of a mathematical treatment of the rankings of certain papers by several competent judges.

2. *The Hillegas-Thorndike scale.*—"The Hillegas Scale for the Measurement of Quality in Composition by Young People" is now widely known,[1] and hence no description of it is necessary. It should be remarked concerning it, however, that such a scale is intended to provide

[1] Milo B. Hillegas, "A Scale for the Measurement of Quality in English Composition by Young People," *Teachers College Record*, XIII, No. 4, September, 1912.

a fixed objective standard. It does not indicate what may be expected at any particular point in the school course. Supposing the scale to be a means of just estimate of excellence in composition, we should still be in doubt as to whether a boy in fifth grade ought to be expected to write a composition as good as some particular example of the Hillegas scale, and if so whether on first attempt or after careful revision. More serious still is the fact that this scale does not take into account the type of writing in each case as determined by the purpose in view. Description, for example, appears in comparison with narrative. Moreover, there is no attempt to distinguish between mere correctness—observance of established usage in grammar and so forth—and style, or the reflection of personality in shaping language so as to produce a given effect.

The practical value of the Hillegas scale is very doubtful. Principal Franklin W. Johnson, of the University High School in Chicago, made a test of it in 1912.[1] He submitted eight themes of high-school pupils, two of which were written by pupils with very inadequate elementary-school preparation, to forty-seven teachers of English composition in high schools, colleges, and normal schools, and also to a class of graduate students who were studying educational tests, with the request that each grade the papers with the help of the Hillegas scale. The maximum variation ranged from 18 to 69 and there was clearly no agreement as to the value of any composition. Mr. Johnson points out in his account of the experiment that the Hillegas scale represents a set of average judgments, while there is no such thing really as an average judgment. He also calls attention to the fact that the Hillegas scale takes no account of content. The examples included in it are singularly lacking in thought and originality. Two scales must be arranged, he thinks, one of which will assist in determining the value of form and the other of content.

Mr. Johnson's conclusions seem to be completely upheld by a far more exhaustive series of trials of the scale which are reported by Frederick J. Kelley in *Teachers College, Columbia University, Contributions to Education*, No. 66. He reduced the Hillegas scale and the ordinary

[1] Franklin W. Johnson, "The Hillegas-Thorndike Scale for the Measurement of Quality in English Composition by Young People," *School Review*, XXI, No. 1, January, 1913.

percentage system to common terms and found that in the hands of novices the latter shows less variation than the former. He says, however, that it remains to be shown whether considerable practice would lead to greater satisfaction in using the scale.

Soon after its publication a trial of the Hillegas scale was made by a number of teachers in Boston and neighboring towns under the direction of William S. Learned, Joseph Lee Fellow for Research at Harvard University.

> A set of fifty papers, written by elementary, grammar, and high-school pupils, was graded subjectively by five elementary-school teachers, five grammar-school teachers, and five high-school teachers. The markers were simply asked to rate the relative value of each paper as a bit of prose composition and to designate this subjective rating by a percentage mark ranging according to judgment anywhere from 0 to 100 per cent. Three weeks later these same fifteen judges, with the Hillegas scale before them, regraded the papers, trying to match each with an example in the scale.[1]

The results of the experiment may be summarized as follows: The average extreme variation on the first marking was 58 per cent; on the second, 44 per cent. The variation of the nine judgments nearest the median was in the first instance from 10 per cent to 43 per cent, and in the second instance from 7 per cent to 32 per cent. The markings were, therefore, more uniform on the second round. It is contended, however, that this was due in large measure to the fact that the teachers came to the second marking with the feeling that extreme variation is undesirable and with greater unanimity of judgment because of the conference which resulted from the first marking. It was found, moreover, almost impossible to compare compositions by elementary-school children with the artificial and bookish samples in the scale. As one teacher said, the tendency was to throw the composition at the middle of the scale in despair of doing anything better.

3. *The Harvard-Newton scale.*—Stimulated by their experience with the Hillegas scale, the teachers and principals of Newton, Massachusetts, at the suggestion of Mr. Frank E. Spaulding, at that time their superintendent, undertook the formation of a scale which should be as free as possible from the defects of those of Hillegas and Thorndike. Working

[1] Charles Swain Thomas, *Leaflet of the New England Association of Teachers of English*, No. 104, January, 1913.

under the direction of Frank W. Ballou, who succeeded Mr. Learned as special research student in the department of education at Harvard University, they gathered typical compositions in description, exposition, argument, and narrative, and through consensus obtained by a scheme which included both grading and ranking in order of relative merit they selected six compositions of each type, representing degrees of excellence ranging from very poor, or about 45 per cent, to very good, or about 95 per cent.[1] These, it will be noted, were the work of eighth-grade children in various schools. When the scale was completed it was tried in practice by principals and teachers in Arlington and Boston.

A particularly useful feature of this scale is the appending to each composition of remarks by the committee upon its merits and demerits, and also of a comparison with the one just above or just below it. This makes the basis of judgment clear and enables the user of the scale to compare other compositions with it so as to give due weight to certain qualities or defects without ignoring others.

What the teachers and principals of Newton have done other teachers and principals should undertake. Not the least valuable feature of such an enterprise is the necessary conference for comparison of standards. In Newton the teachers of English in the high school participated in the work, thus coming directly in contact with the teachers in the grades. The result could not be other than enlightening to all. Even if the mathematical exactness with which the Harvard-Newton scale was worked out seems impossible because of lack of expert assistance, nevertheless, any school may provide itself with a collection of compositions representing the work of every year, or even semester. Each composition should be accompanied by a succinct account of how it was created, as well as by comments upon both its merits and its defects; and there should be sufficient variety of such compositions, ranging in quality from poor to excellent, to represent all sorts of writing likely to be done in each year. These might, in many cases, be supplemented by means of stereographic, or even phonographic, records of oral compositions, and in this way accidental, haphazard, almost wholly personal standards for children's work in composition might be replaced by

[1] Frank W. Ballou, "Scales for the Measurement of Composition," *Harvard-Newton Bulletin*, No. 2, September, 1914.

impersonal, objective, rational standards, which would stimulate to well-balanced and definitely aimed composition-teaching.[1]

Scales would render more valuable such experiments as that in the use of oral work in composition which is about to be described, because it would warrant more confidence in the opinions of those observing the results of the experiment.

4. *The Illinois experiment.*—The Illinois Association of Teachers of English, at the annual meeting in Urbana in November, 1912, selected oral composition as the subject for investigation during the ensuing year.[2] It was proposed to test the truth of the following propositions:

1. Oral composition is in itself an important part of the English work of the high school.

2. Oral composition requires relatively less time from the teacher than does written composition.

3. Proficiency in oral composition carries over into written composition.

A committee under the leadership of Professor John M. Clapp, of Lake Forest College, arranged a course for the second semester of the ninth grade, which was to be taught in two ways: one class would have

[1] Such a collection of compositions is in process at the Chicago Normal College. The form used is the following:

EXAMPLES OF WRITTEN COMPOSITION

Grade..... *School*..... *Date*.....

HISTORY OF THE PAPERS:

1. How the subject was found.....

.....

2. How the subject was worked up.....

.....

3. Conditions under which the writing was done.....

.....

4. Criticism, revision, rewriting, incidental instruction, assistance of any kind.....

.....

5. Additional information.....

.....

NOTE.—Papers of all sorts are desired. Please be very definite as to all the conditions leading up to and surrounding the writing, especially as to assistance given by the teacher. Let each pupil sign his name and state his age.

[2] John M. Clapp, "An Experimental Course in Freshman Composition for Illinois High Schools," *Bulletin of the Illinois Association of Teachers of English*, V, No. 4, January, 1913; "Report on the Experiment in English Composition," *ibid.*, VI, No. 5, February 15, 1914.

only written exercises; the other, a combination of two-thirds oral and one-third written. All classes taking either course were to be given the same written tests at the beginning, at the middle, and at the end of the semester. All the papers written by each class, including these tests, were to be forwarded to the committee in charge of the experiment, accompanied by a report from the teacher, stating as accurately as possible how much time he spent in preparation, in conference, and in correcting papers, and also his opinion as to the results of the experiment.

The outcome was decidedly favorable to the use of oral composition. "The sections taking the combined course were better at the end of the semester in thought—vigor, freedom, interest—than the others; they were better in point of grammatical and rhetorical structure; they were *no worse* in spelling and punctuation and better in handwriting—indeed, the writing sections showed marked degeneration in all matters of mechanics." Over half of the twenty-two schools which carried out the experiment in full reported greater improvement in the combination sections, while only two reported less improvement.

The association adopted the following recommendations of the committee: (1) That oral exercises be made a regular part of high-school English work throughout the course, in the proportion of two-thirds of oral work to one-third of written work in the first year, one-half of each in the second year, and one-third of oral work to two-thirds of written work in the third and fourth years; (2) that school authorities allow time in the daily session for conference on oral exercises to the amount of five minutes per week for each pupil; (3) that each school be encouraged to work out its own course in composition to suit local conditions, stressing in the first year the group method of collaboration and the preparation of themes on how to do something or make something.

This experiment has been described at some length because, dealing with high-school English though it does, it represents the sort of procedure by which the value of certain types of material for instruction may be determined. Moreover, the kind of treatment which was found to be best for the ninth grade would beyond reasonable doubt prove equally satisfactory for the seventh and eighth.

II. TESTS AND RECOMMENDATIONS IN GRAMMAR

The most pressing problem in the grammar grades, however, is to decide what sort and how much of grammar to teach. Opinion on this

subject, as everybody knows, has been oscillating between radical and conservative views for many years. The conservatives hold (1) that the study of English grammar in the elementary school is of great value as an aid to clear and correct composition and intelligent reading; (2) that it is a training in thinking or at least that it "disciplines the mind"; (3) that it is necessary for those who will continue the study of English in high school and take up there the study of foreign language; and (4) that the facts and principles of English grammar belong to the body of knowledge which should be common to all in a civilized community.

The radical opposes some or all of these contentions. He declares (1) that the study of grammar is of little or no value either to composition or to reading, for both are made possible only by habit based upon imitation and not by learning the rules which govern the relating of words in sentences; (2) that the alleged training in thinking does not "carry over" and that mental discipline in general is a myth; (3) that such grammar as is actually needed in high school should be taught there; and (4) that only the pedant sees value in general familiarity with grammatical terms and facts.

There are of course many shades of both radicalism and conservatism and some mixed views, but the summary just made will serve to define the question.

1. *Hoyt's report on grammar.*—The first attempt to determine by scientific methods the place of grammar in the elementary curriculum was made by Franklin S. Hoyt in 1906. The plan followed was, "first, to trace historically the teaching of English grammar . . . . ; secondly, to ascertain upon what grounds the teaching of grammar is justified by current pedagogical literature and by teachers; thirdly, to test the validity of each of these arguments; and, finally, if possible, to draw some conclusions that will aid in the formulation of courses of study in English."[1]

Historically, Mr. Hoyt observes, the study of English grammar came in near the close of the Elizabethan period. "The language had attained its greatest vigor and beauty before the 'science of speaking and writing correctly' had been formulated." The first grammar was for the use of foreigners and was modeled upon the Latin grammars in vogue.

[1] Franklin S. Hoyt, "Studies in the Teaching of English Grammar," *Teachers College Record*, VII, No. 5, November, 1906.

Thus it was loaded down with rules and distinctions not applicable to English, which have been reluctantly dropped because of the scholastic theory that the study of them is good mental discipline.

Persons expressing opinions as to the place of grammar in school Mr. Hoyt classifies as follows: (1) those who believe in teaching no formal grammar in the elementary school; (2) those who would have grammar taught as a distinct regular subject; (3) those who would have it taught only incidentally in connection with the language-work. The second group, those favoring formal grammar, advance the arguments summarized above, particularly that of mental discipline. This argument Mr. Hoyt thinks unimportant so far as elementary children are concerned, since the more abstract conceptions of grammar are for the most part beyond them, and in any event the researches of Thorndike and others have thrown grave doubt upon the whole contention that discipline is to any great extent carried over.

As for the need of laying a foundation for studying other languages, Mr. Hoyt quotes with approval the views expressed by earlier writers, who hold that other languages are well fitted for grammatical study and may well take care of themselves. The few terms in general use can be learned without the necessity of an extended course in English grammar.

The remaining arguments, namely, that both expression and interpretation are aided by grammar study, Mr. Hoyt subjected to investigation. He gave tests in composition, in grammar, and in interpretation to pupils in three cities who had entered high school about four months before. Space will permit only a summary of his results. He found practically no correlation between the ability to answer questions of grammar and the ability to write or to read (a condition which was afterward found to characterize the work of hundreds of high-school graduates who wrote examinations in English for entrance to the Chicago Normal College; indeed, it often appeared in the case of these students that time spent upon formal grammar had been at the expense of training in composition).

The conclusions drawn by Mr. Hoyt from this study were as follows:

(1) A critical examination of the arguments usually advanced in favor of the study of grammar leads to their rejection, in the main, when applied to the present teaching of formal grammar as a separate subject in elementary schools.

(2) It is therefore recommended that grammar should not be taught as a separate subject in the elementary grades, at least below the eighth year.

And that only such grammatical facts and principles be taught in these grades as have a direct bearing upon the use of language for expressing and interpreting thought. Such grammatical instruction should be incidental to the practical study of language, and should evolve from it. During the last year of the elementary course pupils should systematically review and organize the knowledge of grammar thus incidentally obtained, so that it may be permanently retained in convenient form for use and as a foundation for any future linguistic study.

To these was appended, by way of suggestion, an outline of such grammatical forms and classifications as might be taught in the elementary school. This included:

(1) Classification of sentences:
   a) As to form: simple, compound, complex.
   b) As to use: declarative, interrogative, imperative, exclamatory.
(2) Phrases and clauses.
(3) The parts of speech, with only such classifications of them as are actually of use; e.g., proper noun for the use of capitals.
(4) Inflections:
   a) Singular and plural forms of nouns, pronouns, and verbs.
   b) Declension of pronouns. (Case and person developed in connection with personal pronouns.)
   c) Possessive forms of nouns.
   d) Comparison of adjectives and adverbs.
   e) Principal forms of verbs, with little regard to conjugation, mode, voice, tense, etc.
(5) The more useful rules of syntax; e.g., "A pronoun used to complete the sense of an intransitive verb is in the nominative case."

The basis of the selection of this material is obviously its relation to the probable needs of the pupils. It includes all of grammar that is referred to when it is stated that "Grammar is useful as a tool of thought." It excludes all that has been retained solely because of its supposed disciplinary value, or for the purpose of information. The small amount of material remaining, constituting as it does an essential part of the training of English, will be taught in connection with the language-work and, under fairly skilful teaching, so persistently applied as to become an effective tool in the work in composition and interpretation. It will thus no longer remain an illogically distinct subject to be hastily swallowed as a dimly apprehended and distasteful abstraction, but it will be assimilated as a vital part of the child's language experience, thus insuring both a better understanding of the really fundamental grammatical principles and greater skill and enjoyment in the use of the language

as a means of expression. This will be brought about through the better mastery of these grammatical principles and because of the substitution of the more fruitful English work for the discarded instruction in grammar.

2. *Briggs's report on grammar.*—Whether grammar provides an important means of mental discipline, Mr. Hoyt did not investigate. This task was undertaken some years later by Thomas H. Briggs at Columbia University.[1] He made a survey of the claims which have been advanced for formal grammar as a discipline but found no experimental evidence to support them. He accordingly arranged several sets of tests, some of which had previously been used by Bonser, Whipple, and others, to determine the mental ability of children. Two classes in the seventh (the highest) grade of the Horace Mann Elementary School were given intensive work in formal grammar for three months and tested from time to time as to their ability to see likenesses and differences, form definitions, judge reasons, use data, reason in arithmetic, make prompt and accurate associations, follow directions, etc. The results obtained were compared with those which appeared in schools in five other cities and in the practice departments of two normal schools.

There was no gain in any ability which could be attributed to the work in grammar and surprisingly little, in view of the effort put forth, in the knowledge of grammar itself. Mr. Briggs concludes that, while future experiments may lead to different conclusions, the burden of proof, at any rate, is now upon those who believe that general mental discipline is obtained from the study of formal grammar.

3. *Charters' report.*—More recently a study has been made by Professor W. W. Charters, of the University of Missouri, which seems likely to be of considerable value in making out courses for schools.[2] This was an investigation to determine what errors connected with grammatical rules were made by the children of Kansas City, and to determine upon this basis what rules should be taught to children in the elementary grades. Definite directions were sent to the teachers of Grades III–VII[3] as to the sort of written work to collect and also as to noting and recording errors in speech. Only papers which the pupils

[1] Thomas H. Briggs, "Normal English Grammar as a Discipline," *Teachers College Record*, XIV, No. 4, September, 1913.

[2] Not yet published but will appear as a bulletin of the University of Missouri.

[3] The seventh is the highest grade in the elementary schools of Kansas City.

wrote freely without help or corrections were to be handed in. The pupils were to be left unconscious of the test and were not to use any special kind of paper or make any special effort. The purpose was to get during a period of four weeks as much writing as possible, with no repression or caution from the teacher. Errors in speaking were carefully noted and written down by all teachers and principals during the entire school time of a single week.

The oral errors were then classified by graduate students under Mr. Charters' direction, with the advice and assistance of certain of the university instructors in English. The written papers from the sixth and seventh grades in twelve schools were afterward examined and the errors collected. When the various errors were thus assembled and percentage tables made out, it was possible to arrange an outline of the rules actually broken and an additional outline of the rules necessary in order to understand those which had been broken. For example, the rule that a verb must agree with its subject in person and number is unintelligible to one who does not know the meaning of subject, person, number, verb, etc. This procedure made clear what must be included in the course to meet certain definite needs.

The language texts in use in the Kansas City schools were next examined and a statement prepared to show what might be omitted from them. The topics included in this "Index Expurgatorius Grammaticae" are exclamatory sentence, interjection, the appositive, the nominative of exclamation, the nominative of address, the objective complement, the objective used as a substantive, the adverbial objective, the indefinite pronoun, the classification of adverbs, the noun clause, conjunctive adverbs, the retained objective, the infinitive except the split infinitive, mood (except possibly the subjunctive of "to be"), the objective subject, the participle (except the definition and present and past forms), the nominative absolute, and the gerund. Two topics needed to be supplied, the pronoun "what" and proper and numeral adjectives.

Positively the study seems to show that there are a number of grammatical principles which should be well taught. Among these are: (1) proper as contrasted with common nouns; (2) the possessive of nouns; (3) the formation of the plural; (4) the inflections of pronouns; (5) the uses of the relative pronouns; (6) the cardinal and ordinal numerals; (7) comparison of adjectives; (8) verbs as to kind, number,

tense, and voice; (9) adverbs as distinguished from adjectives; (10) idiomatic uses of prepositions and conjunctions; (11) placing of modifiers; (12) double negatives; (13) syntactical redundance, and of course (14) the sentence as a unit. The number of failures to begin a sentence with a capital and end with a period or other proper mark was very large.

4. *Other studies and reports.*—Other somewhat similar studies of children's language are now in progress. For example, the department of education in Harvard University is directing an investigation of the natural history of the sentence in the expressions of children, with the purpose of learning at what stages instruction in certain phases of grammar and composition will supply actual needs. We are clearly about to enter upon a period in which both courses and textbooks in language for the elementary school will be constructed in the light of relatively exact information in place of rough and ready opinion based upon personal impression and unthinking tradition.[1]

III. STANDARDS OF ATTAINMENT

One method of preventing waste of time and effort in school work is to set up definite standards of attainment. Like many other good things, such standards may easily prove harmful. They may, for example, narrow the field of endeavor to the point of hampering the teacher and rendering her work machine-like. Absence of such standards, on the other hand, usually means low pressure, a good deal of useless wandering, and great unevenness of results. The educational rhapsodist is content with purple patches and unfulfilled dreams, but the practical administrator expects tangible and consistent progress. If reasonable latitude is allowed as to the means, there can be no serious objection to fairly definite prescription as to ends.

In English, as in other subjects, the textbook is still the real gauge. Many courses of study undertake to state in general, and even in particular, what is to be accomplished during the elementary period as a whole and during each year or semester of it, but only the strong teacher can carry out such a program without the aid of a book in which the material for each period is arranged and the work which the pupils are to do indicated. Books should, however, be made to conform to the course of study. At present the course of study is generally made

[1] Allan Abbott, "Scientific Standards in English Teaching," *English Journal*, IV, No. 1, January, 1915.

to conform to the books. We must develop a technique of criticism for textbooks. A school board is now almost as much at a loss to tell what books to buy as it is when called upon to select an administrative officer. What action it will take in either case is largely a question of salesmanship.

Interest in the movement for a reform of our educational system by beginning secondary work with the seventh grade has stimulated endeavor to formulate the attainments which should be expected at the end of the sixth grade. In the report of the Committee on the "Six-Year Course of Study," which was presented to the Department of Secondary Education of the National Education Association at the Cleveland meeting in 1908, we find the following specifications with regard to English:

A. *Reading.*—Pupils should be able to get the thought and express the thought in simple narrative prose and poetry, such as *Robinson Crusoe* and "Paul Revere's Ride."

B. *Spelling.*—They should be able to spell correctly 90 per cent of the words commonly used in their home and school vocabulary.

C. *Writing.*—They should be able to write legibly and with fair rapidity.

D. *Composition.*—(1) They should be able to compose and write a business or social letter in conventional form on a simple assigned topic that properly comes within the experience of children of their age. (2) They should be able to compose and write short descriptions and narratives on simple themes appealing to the natural interests of children and falling within their experience.

A somewhat similar attempt to set up definite standards in English for the new elementary schools has been made by the Joint Committee of Thirty on a National English Syllabus, which constitutes one of the subcommittees of the Commission on the Reorganization of Secondary Education, and which is acting under the direction also of the National Council of Teachers of English. In its second preliminary report at St. Paul in July of 1914 a subcommittee of this committee offered the following:

ATTAINMENT IN ENGLISH AT THE END OF THE SIXTH SCHOOL YEAR

The Committee on English has assumed from the beginning that in the near future secondary education in the United States will begin with the seventh school year. Hence, in seeking to provide for proper articulation

between elementary and secondary work in English, the committee has found it desirable to inquire as to what sort of foundation in English can be laid in the first six grades. It cannot be too strongly emphasized, however, that the committee does not assume the right or the wisdom to set up standards of admission to the high school. The painful history of college-entrance requirements and the equally painful history of the overloading of the elementary course of study by the well-meaning college specialists on the Committee of Ten and its subsidiary committees provide a sufficient warning. Such statements of attainment as the present committee will venture to make will be drawn from the actual experience of elementary principals and teachers and will be found modest enough. Indeed, what is most needed is not a theoretical raising of standards but a sorting out of essentials and more generally efficient methods of securing a mastery of them.

It is important to bear in mind that there are two distinct aspects of the process of education. The first is purposeful activity, resulting in habit, and the second is interpretation of experience, resulting in knowledge. Both should have a place in the elementary school, but unquestionably the first should receive chief emphasis there. Children learn by *doing* rather than by the more formal rationalizing processes. Indeed, the chief distinction between the education of children under twelve and those above that age is to be found in the fact that with the seventh grade may be said to begin the really systematic ordering of the facts of experience into scientific knowledge.

It follows that a statement of attainment for the elementary period should be mainly in terms of habits, of ability to do, rather than in terms of facts and principles which the children should be expected to state. Granting that the unity of consciousness prevents any actual separation of doing and knowing, one may nevertheless hold that there is great advantage in measuring achievement in terms of the former. After all, the only sufficient test of ability is the meeting and mastering of real conditions, and teachers need constantly to be on their guard lest they mistake a certain facility in professing the forms of knowledge for actual initiative and control.

With these principles in mind we may now attempt to state in outline what normal children may be expected to do when they have reached the close of the sixth grade:

1. To express clearly and consecutively, either in speech or in writing, ideas which are entirely familiar to them.

2. To avoid, both in speech and in writing, gross incorrectness of grammar.

3. To compose and mail a letter, using a form acceptable for general purposes.

4. To spell the vocabulary which they commonly write and to make sure of new or doubtful words.

5. To read silently and after one reading to reproduce the substance of a simple story, news item, or lesson.

6. To read aloud readily and intelligibly news items from the school paper, lessons from the textbooks being used, or literature of such difficulty as "Paul Revere's Ride" or Dickens' *Christmas Carol.*

7. To quote accurately and understandingly several short poems, such as Bennet's "The Flag Goes By" and Emerson's "The Mountain and the Squirrel."

8. To make intelligent use of ordinary reference books.

Everyone will understand that such an outline is in no sense to be regarded as a course of study in English nor as a complete summary of all that children should and do gain from the study of reading and composition. The more fundamental and far-reaching results, which can be expressed only in terms of character, are here only implied. They come, moreover, if they come at all, from the entire life of the school, not from a single study. Nevertheless, teachers of experience will see at a glance that it will require a well-organized and efficiently administered course to establish, not merely in the exceptional child, but in all normal children, the habits set forth in the seven items mentioned above. For the true best of such habits is that they assert themselves regularly, not merely under the special conditions of a school examination.

Both these statements have been quoted with regard to attainment in all phases of English work in order to show the composition element in its relations. Distinct advance has been made by the second report in the clear emphasis placed upon speech, including correctness of grammar, and in omitting reference to certain types of discourse, particularly literary types. This report also recognizes the problem of articulation between the elementary and the secondary schools.

That subject has been studied with great care by another committee of the National Council of Teachers of English, whose findings concerning composition and grammar are highly suggestive as to the topic under discussion, namely, definite standards of attainment based upon essentials as a means to economy of time.[1] Their recommendations are based upon answers to a questionnaire, upon an examination of a large number of courses of study, reports, and textbooks, and upon personal observation, experience, and conference. The committee had in mind the usual eight-year elementary course, and hence its report covers the grammar grades.

[1] Ernest C. Noyes, "The Articulation of the Elementary and High-School Courses of Study," *English Journal*, III, No. 5, May, 1914.

The committee finds much more called for on paper than by any possibility can be accomplished—maximum courses without principles of selection. High-school topics are being attempted in the grades, especially in the case of formal grammar and rhetoric, while simpler and more essential matters are not thoroughly taught. Written composition is emphasized at the expense of oral. The work to be done is not clearly indicated and confusion must be inevitable.

The committee makes definite constructive suggestions as to what the work in composition and grammar should include and these deserve a careful reading.[1] They have been borne in mind by the present writer in preparing the summary with which this paper ends. To this and the other sources named above may be added numerous state and city courses of study and such articles and opinions as those of Mrs. Fish and Miss Fontaine, reference to which will be found in the bibliography appended.

SUMMARY AND CONCLUSION

At the end of about a decade of study, investigation, and discussion of the problem of economy in language and grammar it appears that progress has been made:

1. In singling out those activities which are most valuable and in setting up definite standards of attainment.

2. In eliminating much abstract and formal material, especially in English grammar. If the grammatical aspects of composition have been consistently dealt with in the grades below, forty recitations in the grammar grades should suffice to organize all the science of grammar likely to be useful to a child of fourteen. This implies that the regular terms for grammatical concepts are used whenever there is occasion to refer to grammatical forms and relations in connection with either speech or writing.

3. In developing standards of measurement by which the results of work in composition may be more accurately determined. Only a slight beginning can be recorded here, however; so complex a product as a written paper cannot be measured as to its various qualities by a single scale like that of Hillegas.

4. In laying a foundation of educational principles in accordance with which the details of economy may be worked out.

[1] *Ibid.*, pp. 311–12.

In seeking to define the essentials of language and grammar we must first discover what the aims of common-school education are. Preparation for life, for example, must be carefully analyzed into those specific aspects which such preparation includes.

The language course must be thought of mainly in terms of habit. Power to speak and to write, not to define technical terms or state rules of correctness, is the end to be attained. The content of oral and written expression as a subject of study in the elementary school is not mainly the principles of composition and grammar but rather the child's own expanding ideas about his environment and his own part in it. Only so much of theory should be taught as can be realized by the child himself, and this should be directly related to his experience.

We must seek to choose that subject-matter for each grade which can be made to seem real, can have a genuine appeal, to the pupils. The mere distribution through a series of years of facts, principles, and practice exercises to develop knowledge and skill which it is supposed will be needed later must be replaced by experiences and formulations which are of real use here and now.

Definite standards of attainment must be set up instead of vague notions of freedom and originality in language or its wooden and mechanical prototype, mere correctness.

This will involve more accurate measures of excellence than we have been accustomed to use. Personal idiosyncrasy and subjective impression must be corrected and supplemented by objective standards by means of which educational experience in one set of circumstances may be compared with like experience in other circumstances, and by which the value of certain kinds of subject-matter and types of reaction may be more accurately determined.

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CHAPTER VIII

CURRENT PRACTICES AND STANDARDS IN ARITHMETIC

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Certain phases of arithmetic have been subjected to challenge for many years. Educational theorists, educational investigators and men in actual charge of educational affairs have been critical toward the content, method of teaching, time expenditure, gradation and achievement in the subject.

The theorists have been especially forcible in their condemnation of the teaching of many of the more or less obsolete topics, the artificialities of method and the amount of time given over to the subject. Hall condemned the amount of time devoted to arithmetic, saying, "Nowhere in the whole curriculum can so much time be saved."

Within recent years there have been a number of special investigations in regard to the arithmetic situation. In 1902 J. M. Rice tested the arithmetical knowledge of more than 6,000 children. In 1908 C. W. Stone tested 6A grades in 26 cities. These men found wide variations in achievement, time cost, methods of teaching and supervision.

In 1913 Superintendent L. H. Van Houten made an investigation of the time distribution, the grade distribution of topics and certain other supervisory phases of arithmetic in 150 American cities. Last year the writer and Dr. L. D. Coffman, working for the Committee on Economy of Time, made an investigation of the time expenditure, grades in which textbooks are introduced, emphasis on drill, eliminations and new topics in almost a thousand school systems.

The men in the field—superintendents and teachers—have also given serious consideration to the demands of arithmetic. In 1887 President Francis A. Walker conducted a campaign in the Boston schools which resulted in an order by the School Committee that the following subjects be dropped from the course of study: mensuration of the unusual surfaces and solids, compound proportion, compound interest, equation of payments, exchange, metric system, compound partnership, etc. In the

report of the Baltimore School Commission in 1911 considerable attention was given to arithmetic as to time expenditure and topical emphasis. Superintendent G. M. Wilson, of Connersville, Indiana, in the same year found, after a detailed investigation of a number of courses of study in use elsewhere, that many cities had already made eliminations.

The American Committee No. 1 of the International Commission on the Teaching of Mathematics reported in 1911 on mathematics in the elementary schools. This committee and its subcommittees contained the names of more than forty men and women more or less intimately connected with the problem of mathematics instruction. As a result of their investigation of the subject, they said, "There is a great pressure to simplify the course. This is being done by using smaller numbers in the work in arithmetic; by eliminating topics that are unduly confusing; by giving carefully graded, simple problems; and by cutting down the extent and increasing the emphasis on the part that remains. There is also great pressure to modernize the course. This is being done by eliminating obsolete problem material, topics and processes, and by substituting therefor modern problem material. There is pressure to make the subject possess informational value as well as disciplinary value."

Mr. S. A. Courtis, director of research of the Detroit public schools, has made the most thoroughgoing study which has yet been made of achievements in addition, subtraction, multiplication and division which are being attained in arithmetic throughout the different grades in a large number of cities. Indeed the investigation of Mr. Courtis has been carried so far that he has already set up certain tentative standards of expectancy for the fundamentals in the upper grades.

With a view to finding out the extent to which superintendents were interested in these problems, their attitude toward certain proposals for elimination and current practice in the schools, the writer and Dr. Coffman last year made an investigation which included returns from 867 cities with a population of 4,000 and over and from 114 county superintendents throughout the country. This report was presented before the Department of Superintendence of the National Education Association at the Richmond meeting. It was found that there was great interest in the topic and that a large percentage of the superintendents were alert to the possibilities of effecting economy of time by means of omitting certain material, redirecting emphasis on certain other

material and modifying the time cost. In fact school superintendents in large numbers are already at work making modifications with a view toward testing the theories or profiting by the facts thus far discovered. Thus in a certain sense this present report might be considered as a clearing-house of experience, which will enable any superintendent to know what other superintendents are doing.

In the judgment of the Committee on Economy of Time the time is now favorable for the widespread dissemination of information in regard to policies already adopted in a large number of cities. Educational theorists have projected certain ideals in the light of the whole field of education. The special investigators have presented a body of facts showing the standards or norms in practice, covering a wide enough range of conditions to warrant certain consideration. The superintendents themselves are experimenting in many different directions. Although theorists, investigators and superintendents are not perfectly agreed, there is sufficient agreement to make it worth while to know its extent on the following points: (1) the elimination of topics; (2) increased emphasis on topics; (3) the recitation time distribution; (4) the percentage of drill; (5) grade of textbook introduction; (6) grade emphasis on topics; (7) the standards of achievement.

THE ELIMINATION OF TOPICS

In view of the fact that such a large percentage of the superintendents of the country have already either eliminated these topics or are in favor of giving them less attention, it is recommended that an economy of time may be effected by the elimination of the following topics from the elementary course of study: apothecaries' weight, alligation, aliquot parts, annual interest, cube root, cases in percentage, compound and complex fractions of more than two digits, compound proportion, dram, foreign money, folding paper, the long method of greatest common divisor, longitude and time, least common multiple, metric system, progression, quarter in avoirdupois table, reduction of more than two steps, troy weight, true discount, unreal fractions.

Chart I, which is based on the expression of the superintendents in 830 cities last year, shows the percentage of superintendents who favor the elimination of or less attention to these topics. (Taken from the investigation of Jessup and Coffman.)

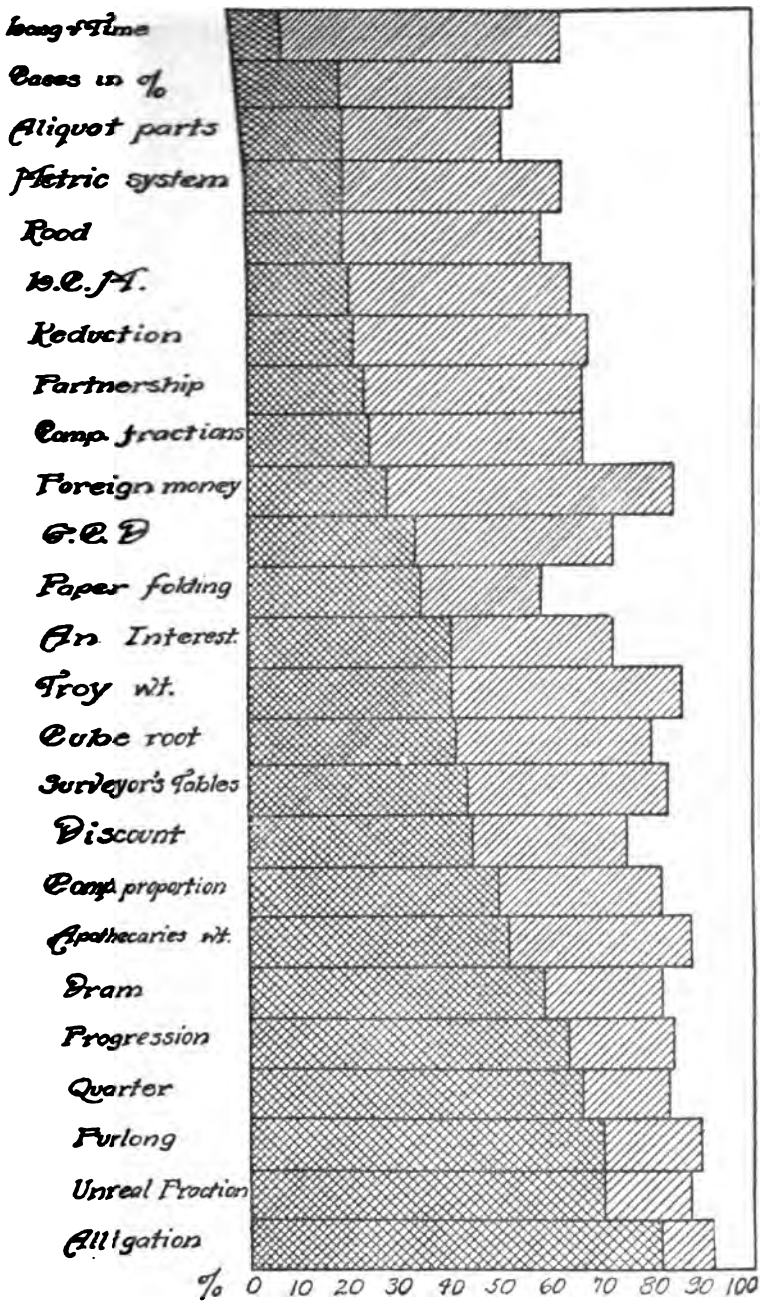

CHART I.—Percentage of superintendents who favor "elimination" or "less attention" (830 cities represented). Checked surface represents the percentage who favor elimination. Shaded surface represents the percentage who favor less attention.

INCREASED EMPHASIS

There has, no doubt, been a disposition on the part of some educational theorists and some superintendents to minimize the importance to be given to training in the fundamentals in arithmetic, viz., addition, subtraction, multiplication, division of whole numbers and fractions. Certain pedagogical theories have tended to minimize the importance of this phase of the work. These theories, coupled with the fact that arithmetic has received a great amount of time, have resulted in a disposition in certain quarters to neglect the teaching of these fundamentals.

However, it is certainly an important fact that the majority of superintendents throughout the country are in favor of emphasizing these fundamentals. It is recommended that this phase of arithmetic be especially emphasized in the intermediate grades to the end that children attain a high standard of ability in these processes by the time they have completed the sixth grade.

It is further recommended that the applications of arithmetic to the social and economic conditions of the day be given especial attention. Time saved through the omission of the material mentioned in the foregoing may be wisely devoted to the study of the social, economic and arithmetical issues involved in such facts as saving and loaning money, taxation, public expenditure, banking, borrowing, building and loan associations, investments, bonds and stocks, tax levies, insurance, profits, public utilities and the like.

Chart II shows the percentage of superintendents who favor giving more attention to each of these topics. (Based on the investigation made by Jessup and Coffman.)

RECITATION TIME

The investigation reported last year brought out the fact that a wide variation existed in the amount of recitation time given over to arithmetic in the various grades. The results of the investigations by Rice, Stone and Courtis have been such as to indicate that it is easily possible to expend more recitation time on arithmetic than conditions warrant. These men are all of the opinion that there is great danger of wasting time here. In view of these investigations and in view of the fact that half of the superintendents are already giving the proposed time or less per week for recitations in arithmetic in the different grades, it is

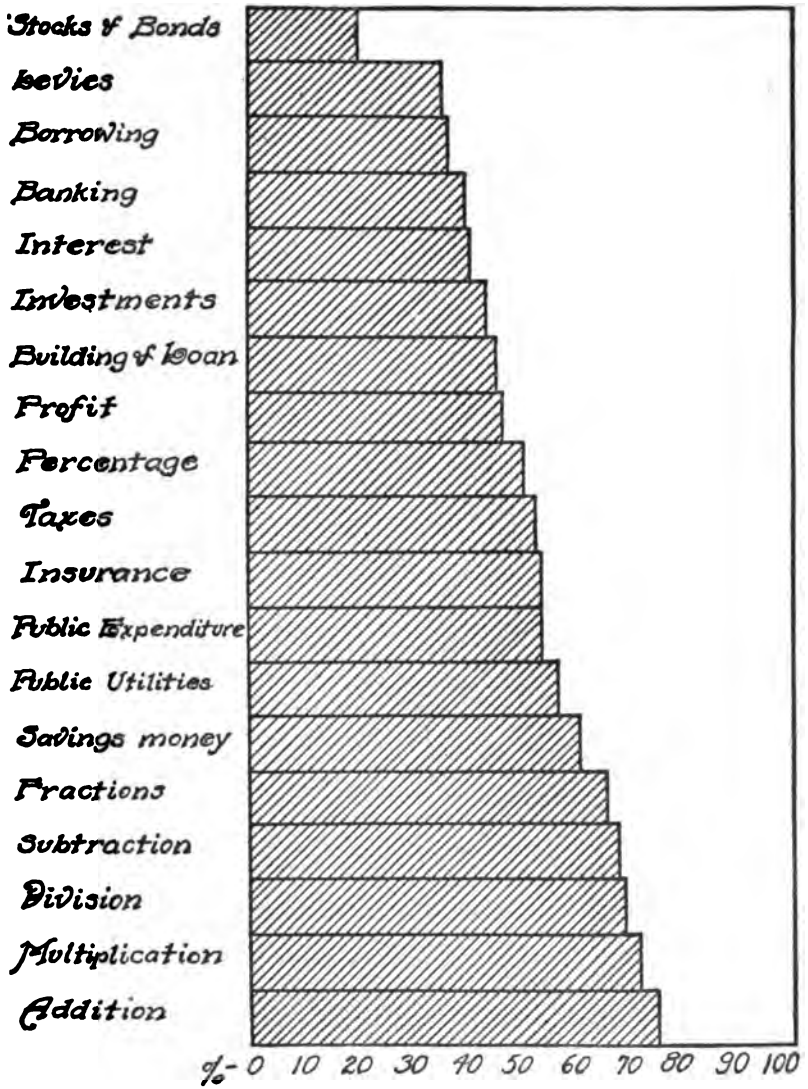

CHART II.—Percentage of superintendents who favor giving more attention to each of these topics (830 cities represented).

recommended that the recitation time devoted to arithmetic not exceed the following limits:

The first grade not to exceed 75 minutes per week.

The second grade not to exceed 100 minutes per week.

The third grade not to exceed 125 minutes per week.

The fourth, fifth, sixth and seventh grades not to exceed 150 minutes per week.

The eighth grade not to exceed 170 minutes per week.

These standards or norms are based on the median recitation time expenditure in 630 cities as reported before this section last year.

Table I shows the actual distribution of recitation time devoted to arithmetic in these cities. (Based on the investigations of Jessup and Coffman.) This table should be read as follows: In the first grade 136 cities allow no time for arithmetic, 7 allow 15 minutes per week, 18 allow 25 minutes per week and so on down the column. (Extreme cases were verified by supplementary correspondence, so that the variations here indicated are truly descriptive of variations in practice.)

Chart III shows the median and upper and lower quartiles for this table.

PERCENTAGE OF TIME GIVEN OVER TO DRILL

There is a clear tendency on the part of the superintendents throughout the country to emphasize the lower grades as the grades demanding the highest percentage of time given over to strictly drill work in the recitation. This is in line with the current educational theory of the nature of the mental life of the child. It is of interest to note in this connection that the school superintendents have either taken the advice of the theorists in this particular or as a result of their own experiences have agreed with the theorists. At any rate it is a fact that at the present time the majority of the superintendents are giving the highest percentage of recitation time to strictly drill work in the second, third and fourth grades. The median percentage of time given to drill work throughout the different grades is as follows:

First grade	43	per cent
Second grade	50	" "
Third grade	52	" "
Fourth grade	45	" "
Fifth grade	39	" "
Sixth grade	31	" "
Seventh grade	22	" "
Eighth grade	17	" "

TABLE I

No. Minutes per Week	Grades								
	I	II	III	IV	V	VI	VII	VIII	IX
0	136	31	4	.....	.....	.....	.....	24	439
15	7	2	.....	.....	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	18	1	1	1	1	.....	.....	.....	.....
30	10	7	5	1	.....	1	1	1	.....
35	1	.....	.....	.....	.....	.....	.....	.....	.....
40	6	4	2	5	2	1	.....	1	2
45	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	99	36	3	1	4	4	2	2	.....
55	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	27	22	10	5	3	4	5	5	4
65	1	.....	.....	.....	.....	.....	.....	.....	.....
70	3	3	1	1	1	1	2	1	1
75	103	127	59	12	4	.....	.....	2	.....
80	6	5	10	11	2	3	1	1	1
85	.....	.....	.....	.....	.....	.....	.....	.....	.....
90	5	6	12	3	4	2	3	3	2
95	.....	.....	.....	.....	.....	.....	.....	.....	.....
100	108	83	156	129	71	31	14	10	3
105	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	1	1	6	5	3	.....	.....	2	1
15	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	6	10	13	13	12	19	22	18	4
125	17	40	90	113	132	109	59	36	5
130	.....	3	4	5	6	9	3	.....	2
35	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	2	4	6	1	9	8	2
45	.....	.....	.....	.....	.....	.....	.....	.....	.....
150	53	66	98	129	158	196	210	192	30
155	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	1	2	4	4	6	2	7	8	5
65	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	.....	.....	2	3	3	1	.....	2	.....
175	6	8	9	20	31	28	35	37	6
180	2	5	6	3	5	9	16	15	4
85	.....	.....	.....	.....	.....	.....	.....	.....	.....
90	.....	1	.....	.....	.....	1	.....	.....	.....
95	.....	.....	.....	.....	.....	.....	.....	.....	.....
200	11	33	54	56	52	72	96	121	60

TABLE I—*Continued*

No. Minutes per Week	Grades								
	I	II	III	IV	V	VI	VII	VIII	IX
205	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	3	2	.....	1	.....	2	5	7
15	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	.....	1	1	2	1	1	1	2	2
225	4	10	25	19	22	28	31	38	27
230	.....	.....	.....	1	1	2	2	2	.....
35	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	4	8	8	4	4	4	7	1
45	.....	.....	.....	.....	.....	.....	.....	.....	.....
250	1	9	25	39	51	51	45	34	13
255	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	1	.....	1	1	2	2	2	.....
65	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	.....	.....	1	1	4	3	2	1	1
275	.....	2	2	8	7	9	8	5	1
To 300	.....	4	14	24	30	30	38	33	5
To 350	.....	.....	.....	3	2	3	7	8	2
To 450	1	1	1	.....	.....	.....	2	3	.....

Chart IV shows the median and upper and lower quartile percentages of time given over to strictly drill work in the recitations in each grade in 564 cities. The standards or norms in the foregoing table are based on the median practice in these cities. (Based on the investigation of Jessup and Coffman.)

GRADE OF TEXTBOOK INTRODUCTION

In recent years there have been a good many advocates of the plan of postponing the introduction of a textbook in arithmetic until the third grade. Advocates of the policy have been found among experienced superintendents as well as among educational theorists. In connection with these recommendations it is of importance to note that of the 764 superintendents reporting last year on this topic it was found that the majority introduced the textbook in the third grade. Clearly the superintendents of this country have adopted the policy of placing a textbook in the child's hands at a relatively late time, as is indicated by the fact that a third of the schools are already postponing the time of introduc-

tion of textbooks until the fourth grade or later. The superintendent who is in doubt as to the grade in which a textbook should be introduced may find some satisfaction in knowing the practice of other superintendents. The exact distribution of the varying practices in connection with the grade of introduction of the textbook is indicated in Table II.

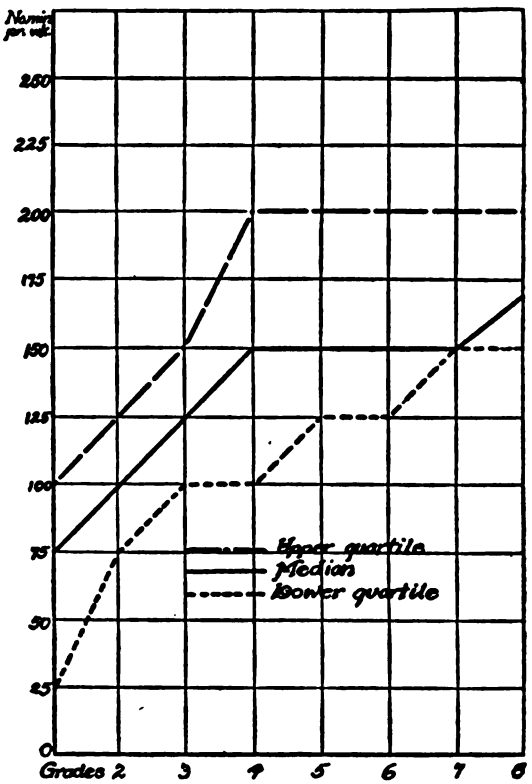

CHART III.—Showing median and quartile distribution of time per week given over to recitations (630 cities represented).

(Based on the investigation of Jessup and Coffman.) The meaning of Table II becomes clear when read as follows: Of the 267 cities reporting from the North Central territory, 1 introduced a text in the first grade, 18 in the second grade, 160 in the third grade, 64 in the fourth grade, 22 in the fifth grade and 2 in the sixth grade.

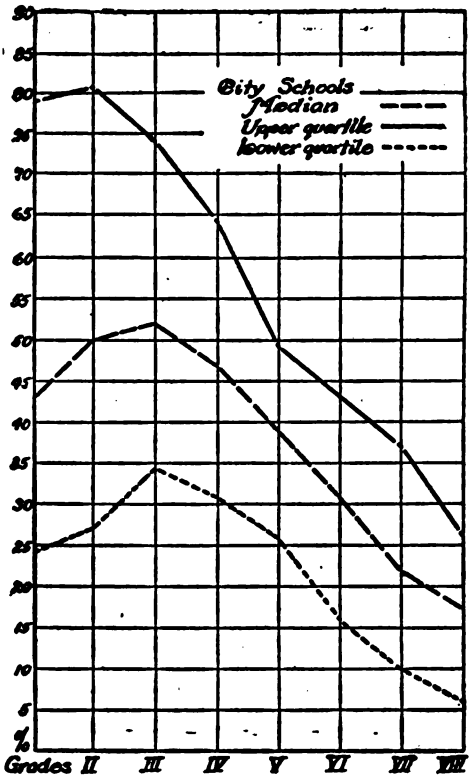

CHART IV.—Showing the median percentage of time given over to *strictly* drill work in the recitations in each grade (564 cities).

TABLE II

SHOWING GRADE IN WHICH AN ARITHMETIC TEXT IS INTRODUCED
(By Geographical Divisions)

	I	II	III	IV	V	VI	Total
North Central	1	18	160	64	22	2	267
North Atlantic	2	9	122	78	15	0	227
Western	0	6	25	17	2	0	50
South Central	0	13	44	17	1	0	75
South Atlantic	0	4	19	5	2	0	30
Counties	2	16	53	28	4	3	106
	5	66	423	209	46	5	754

GRADE OCCURRENCE OF TOPICS

The investigations of Dr. Payne, the Baltimore Commission, the International Commission and others touched the grade distribution of topics. The most thoroughgoing investigation of this sort, however, was made by Mr. L. H. Van Houten, a graduate student in the University of Iowa, now superintendent of schools of Toledo, Iowa, who investigated the distribution of thirty-seven selected topics in arithmetic in 147 different courses of study. These courses represented towns and cities of every size, distributed throughout the United States. He found wide variation in this particular. For example, notation was taught in every grade from the first to the eighth, although it was predominantly present in the third grade. Division was taught in every grade from the third to the eighth, but was predominantly present in the third and the fourth grades. Fractions were taught in every grade from the first to the eighth, and were predominantly present in the fourth and fifth grades. Multiplication tables were taught in every grade from the first to the eighth, but were predominantly present in the sixth grade. Simple interest was taught in every grade from the fourth to the eighth, although it was predominantly present in the seventh grade.

There seems to be less agreement in this particular than we might expect. No doubt many of the differences in practice are due to the textbook variations. Other differences are due to various conceptions of the nature of the mental life of the child and of the nature of the subject-matter. However, it may be said that in the main the four fundamental processes are most frequently taught in the first four grades; fractions, decimals and percentage most frequently in the grades from the fifth to the seventh, with the various applications of arithmetic to the social and economic phases of life becoming predominant in the seventh and eighth grades.

Mr. Van Houten, following the suggestion of the Baltimore Commission, distributed seven specific topics for grade frequency. From Table III it is seen that as far as these 147 cities are concerned the practice prevails of completing the forty-five combinations by the close of the second year; the multiplication tables by the third year; long division by the fourth year; fractions by the fifth year; percentage by the sixth year. Table III is to be read thus: 5 cities complete the forty-five combinations in the first year; 122 in the second year; 14 in the third year; 8 in the fourth year, etc.

While experimental evidence is lacking which will warrant a final statement in regard to the best time for the teaching of the various topics,

TABLE III

FREQUENCY TABLE SHOWING GRADE OCCURRENCE OF SEVEN SPECIFIED TOPICS (VAN HOUTEN)

TOPIC	GRADE							
	I	II	III	IV	V	VI	VII	VIII
Forty-five combinations completed	5	122	14	8	.....	.....	.....	.....
Multiplication tables completed	.....	3	87	53	.....	.....	.....	.....
Long division taught	.....	.....	26	107	5	.....	.....	.....
Addition and subtraction of fractions taught	.....	.....	.....	29	108	13	.....	.....
Multiplication and division of fractions	.....	.....	.....	.....	120	18	8	.....
Decimals taught	.....	.....	.....	.....	91	66	3	.....
Percentage taught	.....	.....	.....	.....	9	93	46	2

yet it is of importance to know the practice of such a large number of cities. It may be presumed that this represents the best judgment of the superintendent, based on experience.

OBJECTIVE STANDARDS

The most definite work in connection with the problem of determining objective standards of achievement for children of the various grades in the fundamentals of arithmetic has been done by Mr. S. A. Courtis, director of research of the Detroit public schools. Mr. Courtis has been able to secure the co-operation of hundreds of teachers, superintendents and school officials to the end that his standard tests have been given to many thousands of children.

As a result of these examinations Mr. Courtis proposes the following standards for children in different grades in connection with the use of his test, on fundamentals of arithmetic, Series B.

In presenting these standards Mr. Courtis says:

"The following table gives the number of examples that should be worked correctly in the time allowed in the four operations with whole numbers. The scores represent standard speed. Teachers should aim at 100 per cent accuracy. At present the average accuracy is about 65 per cent.

"Translated into words, the table means that in June the graduate of a grammar school should be able to work correctly in eight minutes twelve examples like that under Test 1; in four minutes twelve examples like that under Test 2, etc.

TABLE I

JUNE STANDARD INDIVIDUAL SCORE IN THE FOUR OPERATIONS WITH WHOLE NUMBERS

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
3	3	4	3	2
4	5	6	5	4
5	7	8	7	6
6	9	10	9	8
7	11	11	10	10
8	12	12	11	11
Time allowance (minutes)	8	4	6	8
Typical examples	345 487 631 205 943 683 859 175 794	3470127468 1867396737	4179 36	67) 61707

"For any class, the percentage of the class membership which in June can reach or exceed these standards in any operation is a measure of the efficiency of the teaching of that operation in that class. Illustration: If in June eight children out of forty have a score of twelve examples or better in Test 1, with an accuracy of 100 per cent, the efficiency of teaching of addition in that class would be 8140 or 20 per cent. Teachers are urged to measure the efficiency of their own teaching."

SUMMARY

Summarizing, first it is recommended that an economy of time may be effected by the elimination of obsolete material and by the increase of emphasis upon the fundamentals in the intermediate grades to the end that the children may have sufficient facility in the use of these phases to make it possible for the work in the upper grades to be centered around a concrete study of the quantitative phases of present-day social and economic life. Second, it is the dominant practice to center the drill work in the second, third and fourth grades. Third, the adoption of the median time in use throughout the country is recommended as an upper limit of time distribution. Fourth, it is the dominant practice to introduce textbooks in the third or fourth year. Fifth,

it is the dominant practice to complete the forty-five combinations by the end of the second year, the multiplication tables by the third or fourth year, long division by the fourth year, addition, subtraction, multiplication and division of fractions by the fifth, decimals by the sixth and percentage by the sixth or seventh year. Sixth, the standard achievement proposed by Mr. Courtis is commended as being worthy of the serious consideration of the superintendents of this country.

PART IV

MINIMUM STANDARDS AND CURRENT PRACTICES IN THE CONTENT SUBJECTS

CHAPTER IX

THE DETERMINATION OF MINIMUM ESSENTIALS IN ELEMENTARY GEOGRAPHY AND HISTORY

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The following pages report an attempt to evaluate different methods that have been proposed for determining the particular subject-matter that should be included as "minimum essentials" in two of the "content" subjects of the elementary program. The principal problem was not what particular items of knowledge constitute these minimum essentials, but rather what criteria and what methods may be employed with validity in determining these particular items.

A. THE NEWSPAPER-MAGAZINE METHOD OF DETERMINING MINIMA

At a meeting of the Committee on Economy of Time held in the fall of 1912 it was suggested that current literature could be profitably employed as a standard for determining the kind of geographical information that the school should provide. The proposal was to read current newspapers and magazines, record the geographical references, and determine from the frequency of these references the relative value of the various types of geographical information. Results of the application of the method presented at the meeting seemed to indicate that the content of geography as now taught in the elementary school would be greatly modified if materials were chosen upon this basis. The basis of selection itself represents at least one important use that may be made of geographical information.

The writer set this problem as one of the topics in his graduate seminary in educational values during the spring of 1913. A large number of newspapers and magazines were read by members of the

seminary, the geographical and historical references were recorded and classified, and an attempt was made to evaluate the general procedure as a means of determining minimum essentials in these two subjects. While this preliminary work was not sufficiently extensive to justify anything in the nature of conclusive statements, the writer ventures the following opinions as a result of the trial:

1. A thoroughgoing application of the method might well result in a table showing the relative frequency with which certain geographical and historical references recur in the discussions of current problems, and this table might prove suggestive to teachers and administrators, and especially to textbook-writers, as indicating the relative emphasis to be placed upon different topics.

2. So far as the results of our initial test justify inferences they suggest that the present content of history and geography in the elementary school is not radically inconsistent with the need for geographical and historical information as revealed by a study of current publications; that is, the historical and geographical references that seem to recur most frequently in current literature commonly involve types of information already well represented in the school program.

3. If one were to take the newspapers and magazines of a single month as a basis for applying the method, one would be likely to get results that would make the materials taught in the school appear to be somewhat ill adapted to real needs; but when "samplings" of these publications are taken representing periods of from seven to ten years the recurring references stand out distinctly. The actual facts to be taught in the schools should, in the writer's judgment, emphasize the kind of information represented by these recurring references. To provide a basis for interpreting the numerous non-recurring references the pupil should be supplied with geographical principles of general applicability, and with general methods of procedure in finding and interpreting specific information. The recent developments in the teaching of geography have certainly emphasized this type of compromise—a compromise that is inevitable in framing curricula for the elementary and secondary schools. It is quite impossible to predict the precise type of particular knowledge that one will need in order to understand the current literature of ten years hence. To limit our instruction to the specific information that happens to be necessary at the present time would be a most shortsighted policy, but the particular facts

that have been of outstanding value for the past decade may reasonably be predicted to retain their value for some time to come. Beyond a careful impressing of these—using them, indeed, as a basis—it is possible to develop general principles and methods of work that will serve to adapt intelligence to the varying and non-recurring situations.

4. It would be reasonable to infer that, in the material which they furnish to their readers, newspapers are somewhat limited by the basis of interpretive knowledge that they may assume on the part of their readers. This inference is strongly borne out by the results of our initial tests. In certain newspapers we found geographical and historical references very few and far between. In such papers the appeal is largely upon the basis of primitive interests (or instincts) which can be safely assumed to be common to all; hence the so-called "sensational" character of such journals. On the other hand, there are journals that presuppose a large capital of interpretive information among their readers, and which are, for this reason, commonly limited in the number of their readers. This is strikingly illustrated by one periodical which was taken over by a publisher some years ago with the avowed intention of increasing its circulation. He succeeded admirably. We computed the number of historical, geographical, and literary references from an equal number of samplings over a period five years before and five years after the magazine changed hands. As the circulation increased the number of references decreased, and for some classes of references the decrease was almost precisely in proportion to the increase in circulation.

5. It would appear from these suggestions that any method that attempts to utilize current literature as a criterion for the selection of educational materials should be applied with a distinct understanding that it may simply result in a circular form of reasoning: current literature of a "general" nature is likely to represent pretty accurately the level of "general" education. In some respects, it is just as valid to infer from the content of the school program what the character of current literature *will* be as to infer from the character of current literature what the content of the school program *should* be. Certainly, if there is a causal relationship, it is from the school to current literature, and not vice versa.

Typical results of the initial tests.—From the reports of the members of the seminary who aided the writer in testing this method, the following

tables of frequencies have been selected as illustrating the possibilities and limitations of the method; the reports from which these tables are taken were made by the following persons: Miss Alice Biester, Miss Margaret Cobb, and Mr. H. T. McKinney.

Miss Biester collected and classified the geographical and historical references and allusions in eighteen issues of the *Outlook* and the *Literary Digest*, representing a period of seven years ending with 1913.[1] She found in these eighteen journals a total of 2,237 geographical references. The distribution was as follows:

	Per Cent
References to facts of location, size, direction, etc., which may be assumed to require for their understanding a knowledge of "place and location" geography	53.5
References to political divisions and facts of government which may be assumed to require a knowledge of "political" geography	25.1
References to industries, commerce, products, etc., which may be assumed to require a knowledge of "commercial" geography	5.8
References to people, customs, religion, education, etc., which may be assumed to require a knowledge of "social" geography	4.8
References to places as scenes of historical events, which may be assumed to require a knowledge of "historical" geography	1.7
Other references primarily of local or transitory interest	8.9

A grouping of this sort is obviously subject to the errors or peculiarities of individual judgment, but it may be said that the classification just presented is quite consistent with those furnished by other readers. Except for the absence of explicit reference to physiographical principles, this grouping represents fairly accurately the distribution of emphasis in the textbooks ordinarily used in the seventh and eighth grades. The

[1] The method of counting references is an important detail in the technique of this work. Two methods were tried: (1) counting one for each term (such as the name of a place or of a historical event) or each statement with a geographical or historical content; and (2) taking as the unit the article in which the reference occurs, and counting one for each article containing a certain type of reference. (Thus, if London as a commercial center is referred to in an article, this group of references receives one credit, no matter how many times the word London may recur in the course of the article. But if in the same article London is referred to in another way a separate count under its appropriate group is made for this reference.) A comparison of these two methods showed clearly that the latter is to be preferred, and this was used in two out of the three investigations reported.

physiographical principles, however, are precisely the "general" principles to which we referred above; that is, their function is broadly interpretive and adaptive; they "cover" a host of particulars too numerous in the aggregate, and too insignificant separately, to warrant specific attention.

Another suggestive grouping is based upon the frequency of references to the various continents. If one is to read intelligently the journals which formed the basis of this test, one will find occasion to apply one's knowledge of the continents in approximately the following proportions (the maximum frequency of reference being represented arbitrarily by 100):

North America	100	Africa	4
Europe	73	South America	3
Asia	13	Australia	1

The principal European countries had an importance for the readers of the journals in question in the following proportions (giving England, as the country most frequently referred to, the arbitrary value of 100):

England	100	Italy	32
France	80	Turkey	30
Germany	70	Austria-Hungary	24
Russia	35	Spain	22

The countries and colonies of Asia show the following proportions of references as compared with England: China, 55; Japan, 50; India, 19; Korea and Persia (typical of the less important divisions), 4 each.

This order of frequency in references to European and Asiatic countries is fairly constant in the two reports which furnish comparable data.

The frequency of reference to cities is perhaps not so significant, although here, too, there is a goodly measure of similarity among the different reports. A combined rating, which may mean much or little, is given herewith:

FOREIGN CITIES (NEW YORK, 100)

London	31	Constantinople	12
Paris	26	St. Petersburg	7
Berlin	15	Vienna	7
Rome	12		

AMERICAN CITIES

New York City	100	Chicago	26
Washington	27	Philadelphia	20
Boston	27		

There is, in general, a direct although not a perfect correlation between the number of references to cities and the size of the cities—except, of course, that capitals of countries have an importance not always represented by their size.

Compared with references to countries and cities, the references to physical and physiographical features are not numerous. For readers of the journals used in the investigation, information about the following rivers seems to be of the greatest importance and approximately in the order named for the first five: Mississippi, Hudson, Ohio, Missouri, Rhine, Nile, Danube, St. Lawrence, Potomac, La Plata, Seine, Niagara, Rio Grande, Columbia, Amazon, Congo. References to seas and gulfs follow the following order: Mediterranean, Aegean, Mexico, Black, Adriatic, Marmora, Red, and Caspian. The straits most frequently mentioned are the Dardanelles, Bosporus, Magellan, and Bering.

In the journals read, historical references were less frequent than geographical references. In connection with American history the presidents are more frequently referred to than any other group of historical personages, perhaps because of the advantage of associating events in our national history with presidential administrations. In the two reports in which historical data are given Lincoln easily heads the list as the American personage most frequently referred to, having a higher frequency of reference, indeed, than any living person. The following table includes the names of the persons (not now living), prominent during the period of national history, in the order of the frequency of reference in the two reports; the order, however, is not significant beyond the first six (Lincoln is given an arbitrary value of 100):

Lincoln	100	Cleveland	17
Washington	66	McKinley	17
Jefferson	51	Webster	13
Jackson	24	Franklin	10
Grant	20	J. Q. Adams	10
Clay	20	Buchanan	10

In both reports references to wars are more frequent than references to any other single type of historical event, the Civil War easily leading in frequency of reference.

To the readers of the journals in question a very significant importance attaches to an understanding of the federal government. The most important topics appear to be, in the order of frequency of reference: (1) the Constitution itself; (2) the amendments to the Constitution; and (3) the constitutional convention. The number and character of references is especially noteworthy in connection with the large emphasis that has been laid in recent textbooks on the "critical period" in American history. Some suggestions as to the important points of emphasis in the study of civics are embodied in the frequency of references to the powers of Congress, to the different functions of the Senate and the House, and to the administrative departments. The departments stand in the following order of frequency in the references: (1) Department of State; (2) Department of the Interior and Attorney-General's office; (3) Departments of the Treasury and of War; (4) Post-Office Department, and Departments of Commerce and of Agriculture.

In one of the reports, which involved a reading of samplings from a general and rather "popular" magazine covering a period of ten years, there are some suggestions as to the characters and events of world-history with whom (or with which) a speaking acquaintance is perhaps necessary if one is to read such literature intelligently. Of the personages, Napoleon easily heads the list, and the number of references to him, even in this popular magazine, suggests the importance of emphasizing the more important facts of his career at some point during the elementary course in United States history, preferably during the study of the events leading to the War of 1812. Among the other figures of world-history whose names recur with some measure of frequency are Caesar, Louis XIV, Jeanne d'Arc, and Luther. As a commentary on those criticisms of the present-day teaching of history which hold that too much attention is given to the past and too little to recent and contemporary events, it is interesting to note that, in the samplings from ten volumes of this popular American magazine, Caesar is referred to more frequently than any American character except Lincoln, Washington, and Roosevelt; Jeanne d'Arc as often as Cleveland; and Napoleon more frequently than any living political or military character.

Certain critical events or epochs of European history are also referred to with sufficient frequency to suggest the importance of furnishing some information regarding these events in connection (as is readily feasible) with contemporaneous or related events of American history. The most important of these are, in the order of their frequency of reference: the Renaissance, the French Revolution, the Middle Ages, and the Elizabethan period.

While literary references were not included within the scope of the reports, they were collected by one of the readers. In the samplings of the ten volumes of the popular magazine above referred to, Shakespeare's name is mentioned more frequently than that of any other person of any group or age. Other names that recur in the literary group are Victor Hugo, Tolstoi, Burns, Homer, Carlyle, Samuel Johnson, Ibsen, Kipling, and Shaw; and, among Americans, Holmes, Mark Twain, and Howells. Of references to the works of literature, the most frequent are to the plays of Shakespeare, especially the *Merchant of Venice*, *Hamlet*, *Romeo and Juliet*, and *Macbeth*. Of recurring terms that have their source in imaginative literature, the following deserve mention: Lilliputian, Utopia, Utopian, Pickwickian, Rip Van Winkle, Helen of Troy, Shylock, Falstaff, and Gulliver.

It is quite likely that the frequencies of reference given in the foregoing tables would vary with different types of journals, although, as has been suggested, there was a striking resemblance among the three reports which represented, in all, samplings of the *Literary Digest*, the *Outlook*, *Collier's*, the *World's Work*, the *Cosmopolitan*, and the *Review of Reviews*. The earlier work done with newspapers is not included in these reports. The weekly and monthly journals offer much better advantages for applying the method, and it is not probable that anyone would object to the assumption that the work in geography and history in the seventh and eighth grades should fit the pupil to read intelligently such journals as the *Outlook* and the *Literary Digest*, in so far as these journals employ references and allusions to geography and to United States history.

An extended investigation covering forty or fifty periodicals of various types and representing a period of at least ten years would certainly form a basis for an interesting comparison of the frequencies with which places, events, and personages are referred to; and this

comparison might possibly form one index of the relative educational value of the different items of information. Our initial investigations show that the comparisons can be stated in definite quantitative terms; but whether, once these relationships are stated definitely and quantitatively, relative educational values are thereby indicated with the same quantitative certainty is quite another question. The difficulty lies in the fact that both geography and history in the elementary school have other functions to fulfil in addition to providing an interpretive basis for the intelligent reading of current literature, and a method which furnishes very definite standards of value in respect of a single function may do marked injustice to other functions. Before extended modifications are made upon the basis of a single standard, therefore, it would be essential to come to some agreement as to the various functions that a subject should attempt to fulfil.

An extended investigation upon the basis of magazine and newspaper references would probably be worth the cost. It would, however, involve more work of a routine character than could be asked of graduate students. Hence the limitation of our "investigations" to a "trying-out" of methods.

B. JUDGMENTS OF SPECIALISTS AS A MEANS OF DETERMINING MINIMA

A second method for determining minimum essentials is to collect the judgments of special students of the subjects under discussion. This method was applied by Mr. J. E. Wooters in determining the dates and events that may profitably be memorized in the seventh and eighth grades. The investigation was undertaken as part of the work of the seminary mentioned above. The results were published in *School and Home Education* for December, 1914. A questionnaire was submitted to 150 members of the American Historical Association, inclosing a list of 52 dates, and requesting that the 20 most important dates in this list be arranged or "ranked" in the order of their importance, and that other dates not given in the list be inserted if, in the judgment of the person making the reply, these other dates were more important than any given in the list. Eighty-six replies were received to this questionnaire, and of these 49 were used in making the final computations. Every date given first rank on a question-sheet was given a value of 20; every date given second place was given a value of 19; and so on.

The 20 dates which resulted from these combined ratings, and the combined value accruing to each, were as given in Table I.

TABLE I

Rank	Date	Value	Rank	Date	Value
1.....	1776	1,323	11.....	1812	752
2.....	1492	1,261	12.....	1765	629
3.....	1607	1,163	13.....	1783	618
4.....	1789	1,100	14.....	1865 (April 14)	389
5.....	1620	961	15.....	1850	591
6.....	1803	955	16.....	1854	590
7.....	1861 (April 14)	901	17.....	1775	585
8.....	1787	821	18.....	1781	584
9.....	1863 (January 1)	808	19.....	1823	526
10.....	1820	793	20.....	1846	470

An accumulation of similar rankings from a larger number of specialists in history would doubtless result in some slight variations from the order in the given table; it is not likely, however, that the modifications would be at all significant. It is noteworthy that the lists submitted by some of the most eminent of the historians who consented to make the rankings corresponded almost precisely with the final combined list; Professor Edward Channing's rankings, for example, included each of the dates above given, and in the same order with two or three unimportant exceptions. Professor A. B. Hart's rankings were also closely parallel to those given above.

How many dates and events may be profitably associated through automatic memory as a part of the history work in the elementary school is a question that this investigation does not attempt to answer. It was the opinion of the large majority of those answering the questionnaire that a certain number of these automatic associations are essential. An attempt to fix too many will doubtless result either in an excessive amount of drill on dates or in an inadequate mastery of the most important. The problem would seem to be, then, to have the dates listed in the order of their importance, leaving the minimum requirements to be determined by another type of investigation. The writer is personally convinced that twenty may be profitably accepted as a tentative minimum for thorough mastery. This number is smaller than that proposed by the Minnesota report on elimination[1] which gives a list of

[1] "Report of Committee on Elementary Course of Study," *Bulletin No. 51*, Minnesota State Department of Education.

thirty-seven dates—without, however, stating the principle upon which they have been selected.

Mr. Wooters also asked in his questionnaire for judgments regarding the laying of certain other automatic bases in seventh- and eighth-grade history. Out of 70 specialists in history who replied to the question, 49 thought it advisable to have the names of the presidents memorized in the chronological order of their administrations. The importance of making this requirement is also suggested by the results of the newspaper-magazine investigations referred to earlier in this report. In answer to the question, "Should any part of the federal constitution be memorized?" 39 out of 68 who replied answered "Yes." The Preamble and Article I seemed to be the parts most frequently indicated as suitable for memorization. In answer to the question, "Should any part of the Declaration of Independence be memorized?" only 30 out of 67 replying answered "Yes."

The present writer is convinced of the general validity of this method of appealing to special students of the subjects under discussion for judgments regarding the educational value of different topics and items. He would hold, indeed, that every attempt to determine relative values or minimum requirements should involve such an appeal. The facilitating of judgment by asking for "rankings" is an especially valuable feature of the general procedure. It will be essential to check the results obtained through an application of this method by investigations of other types, for unfortunately, as the replies to Mr. Wooters' questionnaire sufficiently indicate, many special students of history have given little attention to the problem of teaching history in the elementary school, and seem indeed quite impatient toward anyone who suggests that a special problem of rather large magnitude is here involved.

C. A COMPARISON OF SCHOOL TEXTS AS A METHOD OF DETERMINING PRESENT-DAY MINIMA

The results of the newspaper-magazine investigations referred to above suggested to the writer the importance of knowing what topics in geography and history have been common to the elementary courses in the immediate past and what topics are common to such courses today. If any modifications are to be made they should certainly be made upon the basis of this knowledge. If a fact or a group of facts has been an ingredient of the common pabulum of universal education for a school generation or longer the presumption is in favor of retaining it,

or at least of modifying it only very gradually. An important function of the "informational" or "content" subjects of the elementary program is to insure a common basis of ideas and knowledge among all of the people. This is all the more important in a democracy, for democratic government involves the collective consideration of common problems, and it is essential to this end that there be a goodly supply of ideas and information common to all of the members of the democratic group. An idea or a fact or a bit of information about a historical event has its value greatly enhanced if it is a matter of common knowledge; it becomes thereby a possible point of reference in collective thinking—a common denominator in the exchange of experience. In the light of this contention, the facts, ideas, and items of information that have been and are the common property of the great majority of the people assume a large significance to the student of educational values.

At the beginning of the present academic year the writer undertook with his graduate seminary an analysis of 24 textbooks that have had an extensive use in the seventh and eighth grades. These books are being carefully compared as to scope of treatment, amount of space devoted to different topics, and style of treatment. Inasmuch as the texts represent each decade since 1860, it has been possible to note the changes that have taken place in the content of elementary history during the past fifty years. The plan of investigation contemplates a determination of the various topics treated and the relative emphasis given to each as represented by the proportion of the entire book devoted to its discussion. It is a fair assumption that the emphasis in teaching generally follows rather faithfully the emphasis indicated by the text; hence a determination of this sort will indicate more clearly than any other practicable method the actual content of the historical instruction. Certainly it is much more trustworthy as an index of past and present "tendencies" than the conclusions drawn from comparing courses of study or school manuals.

This investigation has not as yet been completed, and the results will not be ready for publication prior to the coming summer. A few of the data that have already been tabulated may serve to suggest in a general way the possibilities of the method. It is the intention to continue this procedure with a similar analysis of geographical texts.

An important movement in the last two or three decades in the teaching of elementary history has been to lay less stress upon military affairs,

and to give more attention to social and industrial development. The general tendency is well represented by the tabulations in Table II, showing the relative emphasis that has been and is being given to certain important epochs in American history as indicated by the proportionate amounts of space given to the discussion of the various epochs in the different texts.

TABLE II

AVERAGE PROPORTION OF SPACE OF ENTIRE BOOK DEVOTED TO VARIOUS PERIODS

Period	In Four Books Published from 1860 to 1875	In Four Books Published from 1875 to 1890	In Seven Books Published from 1890 to 1905	In Seven Books Published since 1905
Colonial wars	5.3 per cent	4.2 per cent	3.7 per cent	3.6 per cent
Pre-Revolutionary period (1763–1775)	3.1 " "	1.9 " "	3.6 " "	3.9 " "
War of the Revolution	18.0 " "	15.3 " "	11.6 " "	10.0 " "
1783–1812 (including "critical period")	5.7 " "	9.1 " "	11.1 " "	13.5 " "
War of 1812	5.9 " "	3.2 " "	3.9 " "	3.2 " "
Civil War	15.0 " "	13.1 " "	11.9 " "	10.5 " "

Not only has the proportion of space devoted to wars generally (and, for the major wars, steadily) decreased, but the treatment of war in the school histories has been modified, less attention being given in the more recent texts to the details of battles and campaigns and more attention to the causes of the wars and to social and economic conditions as influenced by the wars.

The treatment of the period of national expansion and growth covering the years 1814–61 is also more extended and detailed in the later texts than in those published twenty and thirty years ago. The proportion of space given to colonial development remains approximately the same. Perhaps the most significant increase in emphasis is represented by the figures in Table II, showing the proportionate space devoted to the "critical period."[1] When the more specific topics are tabulated, the increase of emphasis on industrial and social history will doubtless be clearly revealed.

The names of persons associated with the various periods are particularly significant from the point of view of minimum essentials. It

[1] The Minnesota report on desirable eliminations recommends (p. 6) that the use of the term "critical period" be discontinued, but the reason for the recommendation is not given.

may be truly said that there is no "Hall of Fame" that can compare for a moment with the common pabulum of the elementary program. If a name finds a niche here, it should certainly deserve the honor. As a matter of fact there are wide variations in the number of historical characters referred to in the different texts, and only a very narrow range within which all texts are in substantial agreement. This is clearly shown in the following tabulations.

For the period of exploration and discovery, a total of 109 different names are mentioned in 22 different books, the most common number being between 34 and 39. Of this total, however, only 4 are found in all of 22 books. Giving these an arbitrary value of 100 each, the principal characters of the period in question assume the following degrees of importance *as measured by this standard:*

Columbus	100	Cortez	82
John Cabot	100	Virginia Dare	82
Balboa	100	De Soto	77.5
Raleigh	100	Verrazano	77.5
Vespucci	95.5	Menendez	77.5
Drake	95.5	White	77.5
Queen Elizabeth	95.5	Narváez	77.5
Sebastian Cabot	91	King Ferdinand	77.5
Ponce de Leon	91	Cartier	77.5
Queen Isabella	91	Leif Ericsson	73
Gilbert	86.5	Gosnold	73
Magellan	82	Henry VIII	73

For the period of colonial growth, 200 different names are found in 21 different books, the average number of names in each book being 50. Only 9 names are found in all of the books: John Smith, John Winthrop, Peter Stuyvesant, William Penn, Roger Williams, Edmond Andros, William Berkeley, James Oglethorpe, and George Carteret. The following additional names are found in 19 out of the 21 books: Nathaniel Bacon, Pocahontas, King Philip, George Calvert, John Berkeley.

In connection with the French and Indian War a total of 109 different names are found in 23 books, but of these only 3 are common to all: Washington, Braddock, and Wolfe; while a fourth, Montcalm, is missing in but one.

The pre-Revolutionary period gives a total of 79 different names in 23 books, with only one name found in all—Patrick Henry. James Otis,

William Pitt, and Gage find a place in 19 out of the 23 books and Samuel Adams in 17.

The War of the Revolution involves in 21 books a total of 252 different names, with only 7 common to all, and others arranged on a percentage basis as follows:

Washington	100	Howe	95
Greene	100	Schuyler	90
Gates	100	Allen	85
Arnold	100	De Kalb	85
Cornwallis	100	Morgan	85
Gage	100	Tarleton	85
Lafayette	100	Lincoln	85
Franklin	95	Warren	80
Jones	95	Putnam	80
Stark	95	Montgomery	80
Wayne	95	J. Adams	80
Charles Lee	95	Pickens	80
Marion	95	R. H. Lee	75
Jefferson	95	Pulaski	75
André	95	Clinton	75
Burgoyne	95	Prescott	75
Sumter	95	Sullivan	75

The period 1783–1812 gives a total of 93 different names in 18 texts, the usual number in each book being about 24. Common to all of the books are the names of the four presidents serving in this period (Washington, Adams, Jefferson, and Madison), and, in addition, Jay and Hamilton. Napoleon, Aaron Burr, and Tecumseh are referred to in 15 out of the 18 books.

The period 1812–1861, while rich in names mentioned, shows a very small proportion common to all texts. In addition to the names of the presidents, the only names found in all of 23 texts are O. H. Perry, Winfield Scott, Henry Clay, John Calhoun, J. C. Fremont, and John Brown. Isaac Hull, Webster, Douglas, and Dred Scott find a place in 21 texts.

The period of the Civil War shows a much higher proportion of names common to all of the texts. In 22 books, 21 names are common to all. These are: Lincoln, Anderson, Beauregard, Jackson, McDowell, McClellan, Rosecrans, J. E. Johnston, A. S. Johnston, Burnside, Buell, Thomas, Grant, Farragut, Davis, Sherman, Lee, Hooker, Meade,

Early, and Sheridan. In 21 books the following additional names appear: Bragg, Mason, Slidell, Pope, and Hood.

Much more significant than the names of persons common to the school histories are the topics that are common to all of the texts and the proportion of emphasis given to each topic. Once these data are tabulated we shall know with a fair degree of precision what the common pabulum of the elementary curriculum in respect to history has been in the immediate past, what it is today, and what changes have been made within the last fifty years. In the opinion of the writer, it will then be possible to proceed with measures that may determine from various points of view the additions or eliminations that may be necessary or desirable.

The following graduate students are aiding the writer in this analysis of texts: Misses Bernice Harrison, Margaret Cobb, Olive Paine, Mali Lee, Helen Clark, and Elizabeth Fuller; Messrs. H. Johnston, H. O. Rugg, and A. J. Beatty.

CHAPTER X

THE ESSENTIALS OF LITERATURE

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As supplementary to the chapters on reading and on language and grammar, the following short statement concerning the essentials in the study of literature in the elementary school is offered. A confessedly inadequate treatment is worth while if for no other purpose than to emphasize the fact that literature should be regarded as one of the principal content subjects in the school. Much of the reading, it is true, is, and should be, of a literary character, but the early stages of primary reading must necessarily involve definite attention to graphic forms, and the work which follows should be devoted in part to training children in the reading of books of scientific and matter-of-fact character. As matters stand, moreover, the selections found in the reading-books are often mere excerpts from longer pieces and cannot possibly take the place of complete works of art from the point of view either of fulness of impression or of power of sustained attention. There should be, and in a large number of the schools in the country there is, a continuous course in literature both in prose and in verse from the beginning of the first grade to the end of the eighth.

It is not likely that too much time is devoted to literary masterpieces in any of our elementary schools. The problem of economy is one of selection and method of treatment. For almost a generation a sifting process has been going on which seems to have resulted to a remarkable degree in unanimity of choice of literature for the elementary school and even of uniformity of grading. This appears in two interesting studies made at the University of Chicago under the direction of Assistant Professor J. F. Bobbitt and published in the *Elementary School Teacher*.[1] Some fifty courses of study from representative cities and towns were examined as to the stories and poems included and the

[1] XIV, Nos. 4 and 5, December, 1913, and January, 1914.

grades to which the various selections were assigned. In the lists of longer readings—books, long stories, and longer poems—138 authors represented by 296 titles were found. Of these, 183 titles appeared four or more times in the fifty courses, while a number of selections were named as many as twenty-five or even thirty times. From the entire list a selection by grades was made of the titles appearing nine times or more. This ought to be of very great value to any course-maker in determining what pieces are most likely to be of most value in certain grades in his own school.

The titles of the literary selections most frequently memorized in the elementary school were taken from thirty-four state, county, and city courses of study, including Hosic's *Elementary Course in English*. Eight hundred and thirty-four titles were counted, and by eliminating all appearing less than three times, it was found that 140 authors were represented by 383 titles. These were then arranged in two tables, the first alphabetical by authors and the second alphabetical according to the grades for which the poems were most often recommended. As in the case of the longer readings, this second table supplies a list of well-tried selections for each of the eight grades and might well be made the foundation for a course in any school.

There remains the question whether there are any fundamental principles in accordance with which selection may be made of the most useful poems, stories, and plays to be taught to children. It is the function of literature to serve as the artistic interpretation of life. It is, throughout, the expression of human interests, human emotions, and human nature. By means of it children are to come to appreciate the ideal elements in life and nature and by means of it their aspirations are to be shaped, their feelings refined. It would seem, therefore, that the choice of literary material for school use should depend upon the power of appeal and enduring value of the content of the selection under consideration. One must take into account also the maturity, subtlety and scope of ideas, as well as the need of a balanced ration.

With such a point of view a committee of principals and teachers in the city of Chicago undertook some years ago to compile a classified list of poems and stories for the grades. Some of the headings which were used were as follows: "Home and Community," "Ideals of Life and Conduct," "Physical Nature," "Rhyme and Nonsense," "Songs," and in the case of prose pieces, "Household Tales," "Wonder Stories,"

"Heroism and Romance." Everyone will see the danger of such a definite classification. It may of course narrow the view of a given selection; it may lead to didactic treatment; and it cannot in any case be exhaustive. It may, however, suggest the chief value of a given selection, and above all it may serve to secure for the children a variety of experience with literature.

A somewhat similar outline of the work in literature was prepared about the same time (December, 1902) by Miss Mary McSkimmon for the schools of Brookline, Massachusetts. She selected an ethical center for each grade and made a list of stories, poems, and entire books to go with these. These ethical centers were as follows:

Grade I. The Love of Home and the Duties of Children Therein.

Grade II. The Love of Animals, and the Responsibility for the Care and Happiness of Pets.

Grade III. Love for One Another; the Child as an Individual Member of the Human Brotherhood.

Grade IV. The Duty of Self-Control.

Grade V. Courage: the Duty of Purposeful, Heroic Effort.

Grade VI. Obedience, and Service Rendered through Obedience.

Grade VII. Wisdom: Service through Knowledge and Goodness.

Grade VIII. Patriotism: the Character of a Good Citizen.

Grade IX. Service through Character.

The difficulty inevitable in such a plan is, of course, that of finding material within the comprehension of the children of the various grades. There is danger also that pieces that ought to be taught will fall outside the scheme. The list selected by Miss McSkimmon is, however, very good and may well serve to emphasize the importance of including in any list of literary material for children a number of pieces the spirit of which is distinctly ethical. This must not imply a didactic treatment in the classroom.

Very little experimentation or really scientific study seems to have been undertaken in the field of children's literature. Two examples are to be found in British publications. In the *Journal of English Studies*[1] appeared recently a series of short poems and selections from poems representing a sort of scale of literary excellence. These poems were presented to different groups of students, both youthful and mature, some of whom had had literary studies in school and others not. The

[1] January–April, 1914.

object of the experiment was to determine whether school work in literature actually develops discriminating taste. The author of the article concludes that it does. His experiment might well be repeated by others, who should take pains to use only complete selections unless, indeed, such elements of treatment as phrasing or rhythm are to be specially considered.

The second contribution is by Professor I. Lawrence, who writes on "Children's Humour" in the *Journal of Experimental Pedagogy*.[1] He collected some 200 papers from several types of schools with the aim of discovering what children laugh at and how this varies according to age and circumstances. The children wrote, as unprepared compositions, accounts of the funniest things that they had heard, read, or directly experienced.

Professor Lawrence divided the papers into three groups. The first was made up of those written by very poor children ranging from ten to thirteen years of age. They found their humor principally on the street and at the "movies." The principal source was grotesque appearance and action. The second group was written by children from comfortable homes. They found their humor in the trivial incidents of current books and magazines. They showed, however, much more power of intellectual perception than the first group. The third group was written by children from fourteen to seventeen years of age who were attending an excellent secondary school. Their home circumstances were those of the upper middle class. The papers in this group were markedly individual. The young people showed a considerable development of self-realization. The laughter was critical.

Such a study as this is highly suggestive as to the kind of work which might be undertaken to discover what powers of appreciation children in certain circumstances and at certain stages of intellectual growth might be expected to have, and therefore what material could be made to appeal to them. This is not to say, of course, that they should be given only what they can understand readily, but rather what they can reach up to.

This suggests a closing word. It is undoubtedly true that much of the time now spent on the study of literature in the elementary school is wasted because of a lack of definiteness of aim and of appreciation of the values peculiar to the selections taught. The visitor to the

[1] II, No. 5, June, 1914.

reading class as well as to the story-hour is often impressed with the evident preoccupation of both class and teacher with a multitude of details which are not in any way related to the chief purpose of the selection. If each piece were approached with the expectation that it will have a definite impression to make and if the teacher were to bear in mind from first to last that details are valuable only as they enable this chief impression to be made effectively, the hours spent with the masterpieces of the poets and the story-tellers by our children would be many times more memorable than they usually are at present. To speak of but a single possibility, it is literature which, above all else, may instil into the mind those ideas upon which our American democratic society is founded and which bind us together as a united people.

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CONSTITUTION OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

(Revision Adopted in Chicago, February, 1909)

ARTICLE I

Name.—The name of this Society shall be "National Society for the Study of Education."

ARTICLE II

Object.—Its purposes are to carry on the investigation and to promote the discussion of educational problems.

ARTICLE III

Membership.—SECTION 1. There shall be three classes of members—active, associate, and honorary.

SEC. 2. Any person who is desirous of promoting the purposes of this Society is eligible to active membership and shall become a member on approval of the Executive Committee.

SEC. 3. Active members shall be entitled to hold office, to vote, and to participate in discussion.

SEC. 4. Associate members shall receive the publications of the Society, and may attend its meetings, but shall not be entitled to hold office, or to vote, or to take part in discussion.

SEC. 5. Honorary members shall be entitled to all the privileges of active members, with the exception of voting and holding office, and shall be exempt from the payment of dues.

A person may be elected to honorary membership by vote of the Society on nomination by the Executive Committee.

SEC. 6. The names of the active and honorary members shall be printed in the *Yearbook*.

SEC. 7. The annual dues for active members shall be $2.00 and for associate members $1.00.

ARTICLE IV

Officers and Committees.—SECTION 1. The officers of this Society shall be a president, a vice-president, a secretary-treasurer, an Executive Committee, and a Board of Trustees.

SEC. 2. The Executive Committee shall consist of the president and four other members of the Society.

SEC. 3. The president, vice-president, and secretary-treasurer shall serve for a term of one year. The other members of the Executive Committee shall serve for four years, one to be elected by the Society each year.

SEC. 4. The Executive Committee shall have general charge of the work of the Society, shall appoint the secretary-treasurer, and may, at its discretion, appoint an editor of the *Yearbook*.

SEC. 5. A Board of Trustees consisting of three members shall be elected by the Society for a term of three years, one to be elected each year.

The Board of Trustees shall be the custodian of the property of the Society, shall have power to make contracts, and shall audit all accounts of the Society, and make an annual financial report.

SEC. 6. The method of electing officers shall be determined by the Society.

ARTICLE V

Publications.—The Society shall publish *The Yearbook of the National Society for the Study of Education* and such supplements as the Executive Committee may provide for.

ARTICLE VI

Meetings.—The Society shall hold its annual meetings at the time and place of the Department of Superintendence of the National Education Association. Other meetings may be held when authorized by the Society or by the Executive Committee.

ARTICLE VII

Amendments.—This constitution may be amended at any annual meeting by a vote of two-thirds of voting members present.

MINUTES OF THE MEETING OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION AT RICHMOND, VIRGINIA, MONDAY, FEBRUARY 23, 1914

An audience of some three hundred persons assembled in the annex of the Seventh Street Christian Church to hear the discussion of the *Thirteenth Yearbook* of the Society. This relatively large number was attracted by the fact that the discussion concerned high-school problems, the title of the *Yearbook* being "Some Aspects of High-School Instruction and Administration."

President M. G. Brumbaugh called the meeting to order at 8:00 o'clock, and presided with unusual skill. The first paper, entitled "Reconstructed Mathematics," by H. C. Morrison, state superintendent of schools of New Hampshire, was discussed by David S. Snedden, commissioner of education for Massachusetts, and P. Johnson, of Woodward High School, Cincinnati, Ohio. The second paper, entitled "Supervised Study," by E. R. Breslich, of the University High School, University of Chicago, was discussed by C. H. Judd, director of the School of Education of the University of Chicago, and by J. S. Brown, superintendent of the Joliet, Illinois, Township High School. The last paper, entitled "North Central High Schools," by L. D. Coffman, of the University of Illinois, and W. A. Jessup, of the University of Iowa, was discussed by the latter.

A paper entitled "The Organization of School Surveys in Towns and Cities" was read by H. L. Smith, superintendent of schools in Bloomington, Indiana, in anticipation of the *Yearbook* in preparation by the same author.

The report of the nominating committee was presented and the following officers elected: President, Superintendent J. M. Gwinn, of New Orleans; Vice-President, Superintendent R. J. Condon, of Cincinnati; Member of the Executive Committee, State Superintendent H. C. Morrison, of New Hampshire; Member of the Board of Trustees, L. D. Coffman, of the University of Illinois.

At 10:00 P.M. the Chairman declared adjourned one of the most vigorous meetings held by the Society in recent years.

S. CHESTER PARKER, *Secretary*

FINANCIAL REPORT OF THE SECRETARY-TREASURER OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

DECEMBER 23, 1913, TO DECEMBER 23, 1914

RECEIPTS FOR 1914

Balance on hand December 23, 1913			$1,007.48
From sale of *Yearbooks* by The University of Chicago Press:			
June to December, 1913	$259.68		
January to June, 1914	423.35	683.03	
Interest on savings bank account:			
To January 1, 1914	$ 11.81		
To July 1, 1914	12.78	24.59	
Dues from members (current and delinquent):			
Active	$294.30		
Associate	88.10		
		$382.40	
Total income for the year			$1,090.02
Total receipts including initial balance			$2,097.50

EXPENDITURES FOR 1914

Publishing and distributing "Yearbooks":		
Printing *Thirteenth Yearbook*, Part I ("High-School Instruction")	$404.10	
Reprints of article ("North Central High Schools")	18.80	
Distributing *Thirteenth Yearbook*, Part I, to members	24.52	
Printing *Thirteenth Yearbook*, Part II ("School Surveys")	277.55	
Distributing *Thirteenth Yearbook*, Part II, to members	21.49	
Distributing *Twelfth Yearbook*, Parts I and II, to members	33.90	
Distributing *Yearbooks* to members, miscellaneous	2.60	
Total cost of *Yearbooks*		$782.96
Carried forward - - - - - - - -		$782.96

Brought forward - - - - - - - - -		$782.96
Printing circulars about membership		3.00
Secretary's office:		
Secretary's salary from end of Philadelphia meeting, February, 1913, to end of Richmond meeting, February, 1914	$100.00	
Secretary's traveling and hotel expenses for Richmond meeting	52.25	
Typewriting	20.95	
Bookkeeping	17.75	
Stamps	17.80	
Stationery	9.05	
Telegrams	.96	
Exchange	5.50	
Total for Secretary's office		224.26
Total expenses		$1,010.22

SUMMARY

Total expenditures for 1914	$1,010.22
Balance on hand December 23, 1914	1,087.28
Total	$2,097.50

MEMBERSHIP

Number of active members (including one honorary) December 23, 1914	168
Number of associate members December 23, 1914	102
Total membership	270

S. CHESTER PARKER, *Secretary-Treasurer*

The accounts of the Secretary-Treasurer were audited for the two years ending December 23, 1914, by C. H. Judd and O. W. Caldwell, acting for the trustees of the Society, and found to be correct.

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Educ P 395.4

THE FOURTEENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

PART II

METHODS FOR MEASURING TEACHERS' EFFICIENCY

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS

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BY

ARTHUR CLIFTON BOYCE

Sometime Assistant in the Department of Education of the University of Chicago

Edited by S. CHESTER PARKER

THE UNIVERSITY OF CHICAGO PRESS
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J. A Lowell fund

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PREFACE

The study of methods of measuring teachers' efficiency published in this *Yearbook* was begun by Mr. Boyce while a student in the Department of Education at the University of Illinois and was continued later while he was a student and assistant in the same department at the University of Chicago. It is one step in the process of applying methods of careful investigation to the study of a very important practical phase of school administration. Since this process of applying scientific method to practical contemporary educational problems has characterized the work of the National Society for the Study of Education, the present *Yearbook* continues the well-established publishing policy of the Society.

THE EDITOR

METHODS FOR MEASURING TEACHERS' EFFICIENCY

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INTRODUCTION

NEED FOR RATING OF TEACHERS

The measurement of teaching efficiency is related to the efficiency of the school in three fundamental ways:

1. *Vocational guidance of teachers* requires a method for determining their relative merit. First, before students can be intelligently directed into the teaching profession, we must have an analysis of the qualities necessary for teaching efficiency as revealed in successful teachers. Secondly, we should have a method of analysis which would reveal the proper place for a teacher with given qualifications and the proper teacher for any given place.

2. A measuring scheme is necessary for *the improvement of teachers in service.* (*a*) It would serve as a basis for self-criticism and self-improvement on the part of teachers; with the standard before them, teachers need not wait till their weaknesses are pointed out by supervisors. (*b*) Such a standard is necessary if the supervisor's criticisms are to be complete and definite and therefore properly helpful. (*c*) The supervisor would not need to spend energy on all points but could concentrate on those points where the measurement revealed need for help. (*d*) The presence of a definite standard for efficiency would itself be a spur to improvement by laying emphasis on important points.

3. An even more effective spur to efficiency would come through the application of definite measurement to *the determination of promotion and dismissal.* (*a*) An important application in this connection would be to the salary schedule. The determining factors for salary adjustment are usually sex and length of service. Neither of these factors may properly determine a teacher's salary unless the school wishes to pay for something other than service rendered. Neither should the grade taught be made the basis of salary. Every grade is worthy of the teacher's best efforts. She should be paid according to her efficiency in

the place she has and should be encouraged to improve her value there instead of being encouraged to try for a different grade. (*b*) Some scheme of measuring teaching efficiency is needed as a basis for intelligent promotion in position. Promotion should be given to those who show promise of being more useful in the higher place. Politics and favoritism must be eliminated from the election and promotion of teachers and school officers if our schools are to be the efficient organizations they should be. (*c*) Finally, justice to the teachers demands that dismissals be made on an impersonal basis of proved inefficiency. Such a basis must be furnished by some method of determining efficiency which will make the cause of failure very clear.

The instrument likely to be of most benefit to the school in a proper selection of its teachers, in their improvement during service, and in properly rewarding their efforts is a measurement for teaching efficiency which shall be the basis for action in each of these important phases of the school's relations with its teaching body.

The present study is an attempt to make some progress toward meeting the needs described above, by trying to answer these questions:

1. How do school superintendents and principals determine the relative value of their teachers?
2. What are the qualities of teaching merit which should be considered in judging teachers?
3. What are the relative values of these qualities of merit?
4. What is the best way to determine the presence of these qualities in teachers?
5. What is the reliability of the judgments supervisors give of their teachers?

CHAPTER I

PRESENT METHODS OF MEASURING TEACHING EFFICIENCY

A study of present practice in that important part of school administration having to do with the measurement of teaching efficiency reveals the greatest diversity of method. The study also discloses a surprising number of large cities having no method at all in determining the relative specific efficiency of their teachers.

Replies from 242 representative cities in all parts of the United States are the source of our information as to methods used. Three hundred and fifty cities of over 10,000 population were asked to give us a brief statement of their methods of determining and recording the efficiency of teachers and to send us any printed rules, directions, schedules, or reports they might have in this connection.

In general, two methods are in use: examination and rating. The relative importance is shown by the following summary:

	Number of Cities Reporting
1. Promotional examinations	14
2. Schedule of qualities on which teachers are judged	133
3. Efficiency grades for teachers	99
4. Judgment of teachers not controlled	98

It will be seen that promotional examinations do not in general play a large part in measuring teaching efficiency. They are never the sole factor determining the teacher's rank but are found in combination with length of service or efficiency of service or both.

MEASUREMENT BY EXAMINATION

Purposes served by examinations.—Examinations as related to teaching efficiency have three avowed purposes: (1) to determine entrance into service, (2) to control promotion of teachers from one salary group to another or from present positions to those more responsible, and (3) to stimulate continued study on the part of the teacher.

1. Entrance to service in large systems must be controlled by some such civil-service examination as will eliminate those obviously unfit. Applicants lacking the necessary academic and professional information

may be sifted out by examination. Preliminary examinations of this sort are not properly measures of teaching efficiency. They are somewhat indicative of the probable teaching ability of the candidate and determine the order in which the successful applicants are taken into the service, but ability to apply the knowledge displayed in the examination must be tested during a period of teaching, or by referring to the applicant's past experience.

2. A more real connection between examinations and teaching efficiency is found in what are usually called "promotional examinations." When these examinations are used for the purpose of selecting principals, supervisors, or other school officers from the ranks of teachers, they are not different in character from those admitting applicants to service as teachers. The examinations are simply more extended and more searching, especially in fields having to do with administration or the special branch of supervision sought.

Examinations which determine the advance of teachers from one salary group to another vary greatly in character from city to city. They may consist of the earning of credits in college extension courses or summer schools, or the presentation of theses on professional problems, or papers reviewing certain professional reading, or they may be regular examinations set on professional or academic subjects. Choice of two or more of these types of examination may be offered at the same time. Eligibility to these examinations for promotion in rank or salary usually depends on the number of years the teacher taught and the success of her previous work.

3. In all cases it is evidently the purpose of the examinations for promotion to be a spur to and a test of continued study and professional interest on the part of the teachers in service. In most instances the taking of the examinations is optional, but the fact that further increase of salary depends on it is compelling enough.

Success of measurement by examination.—To discover to what extent the purposes of examinations are really accomplished would require an extended investigation into those systems which employ them. Superintendents differ widely in their opinion as to their value. That examinations are negatively valuable in eliminating weak candidates for teaching and supervisory positions is no doubt true, but that they are positively valuable in determining the relative merit of teachers in service cannot be maintained with confidence. In no case, how-

ever, so far as we are aware, are promotional examinations the sole basis of judging teaching merit. The result of the more or less artificial and detached examinations is considered in connection with the actual accomplishment of the teachers in the schoolroom, however this may be measured.

One objection frequently made to promotion by examination is that it forces on the teacher an amount of study she is not always ready to undertake, that if the teacher is conscientious and doing all that she can in the schoolroom she cannot spend time and energy on outside study without damage to her health or her regular work. This objection is overcome somewhat in those cities which make very close connection between the study for examination and everyday school work. Thus Baltimore insists that the thesis written as part of the examination in that city be on a problem in which the teacher is interested in connection with her daily work. In other cities the professional reading to be reported on is perhaps no more than the teacher should do without compulsion.

This objection applies also to work done in summer schools and college extension courses. When credits for promotion are earned in this way, teachers are usually limited as to the number that may be earned in one year. A more serious objection in the minds of teachers is that the expense involved in earning credits during attendance at a summer school is frequently more than the increase in salary justifies.

The stimulus which promotional examinations give to professional reading and study along other lines calculated to keep the teacher mentally alert and up to date is no doubt very large. Superintendents report that the introduction of promotional examinations has done much for their teachers in this way.

The fact that classroom efficiency is in almost all cases a condition of eligibility to promotional examinations, and that, in all but a small percentage of school systems, success in actual teaching work is the only basis of promotion aside from years of service, shows that "proved fitness in the classroom and out of it as a unit in a working machine" is the vital factor in the promotion of teachers.

Teaching merit is almost universally determined by some sort of rating or estimation of the value of the teacher by one or more school officers who are in a position to judge her work. The methods used in rating teachers is our next consideration.

RATING OF TEACHERS

Methods of rating teachers seem to fall into two classes, the first of which might be called the general impression method and the second, the analytical method.

General impression method.—We have at hand replies from approximately 100 cities which are plainly to be classed under this head. This method, if it can be called such, is doubtless characteristic of the majority of school systems and is one evidence of how little this important work of judging teaching efficiency has been systematized, rationalized, and controlled. The following quotations, taken almost at random from letters received, show very well the indefiniteness and looseness of such a method:

Aberdeen, South Dakota.—"We have 70 teachers, and our means of judging them is by visiting their classes and by the results they obtain in advancing the pupils under them."

Aurora, Illinois.—"The judgment of the superintendent as to the efficiency of the work done decides the promotion to the advanced salaries."

Baton Rouge, Louisiana.—"[The teachers are judged] by results obtained and opinion of principal based on observation of work."

Berkeley, California.—"The principal rates the teachers."

Canton, Ohio.—"We reappoint teachers with regular increase of salary according to schedule—provided they do good work. We decide this by visiting the school during the year."

Champaign, Illinois.—"Nothing but general observation. Until we can know the effect on the lives of pupils, we cannot rate the efficiency of teachers justly. I trust personal judgment."

Charlotte, North Carolina.—"Teachers are promoted according to their qualifications and fitness for the better position. This is left to the judgment of the superintendent and board."

Chicopee, Massachusetts.—"A teacher is judged by what she does or accomplishes with the material (apparatus and pupils) given her. Personal observation of her work."

Dubuque, Iowa.—"Nothing formal. The superintendent makes his rating, however, on the basis of the teacher's efficiency."

Easton, Pennsylvania.—"We have no definite plan when rating and promoting teachers except a general committee discussion at the end of the year."

Enid, Oklahoma.—"There are so many, *many* qualities which enter [into teaching efficiency] that our system has never undertaken to classify them. We take each teacher and get the product of all factors in *her*, without reducing her to a mathematical formula."

Fresno, California.—"The judgment of the principal and the superintendent is the basis of rating teachers."

Hamilton, Ohio.—"We have no fixed rule or schedule for rating teachers. The only question which we consider is the efficiency of her work, and this is gauged by the superintendent and principals."

Harrisburg, Pennsylvania.—"We have nothing of this kind except for entrance into our corps. Once in, all teachers advance automatically if good enough to retain at all."

Iowa City, Iowa.—"Largely the judgment of the principal and superintendent."

Johnstown, Pennsylvania.—"For the benefit of us supervisors, we classify the teachers at the end of the year into Excellent, Good, Fair, Failure—above based on general impressions."

Lansing, Michigan.—"General observation by principal and superintendent."

Mt. Carmel, Pennsylvania.—"Superintendent recommends promotion in salary and advises position as he sees teacher's fitness for work."

Nashua, New Hampshire.—"It is merely a question of judgment on the part of the superintendent."

Newburgh, New York.—"By observation of their work and results obtained."

Oswego, New York.—"Personal knowledge and observation [of superintendent]."

Sioux Falls, South Dakota.—"The superintendent and the principal judge the teacher by the progress made by the children under her charge."

It will be seen that the work of rating the teachers is done in one way or another by the principals or superintendents or both. The *way* is not specified and the judgments are apparently not controlled by any outline of factors, definitions, or rules of any kind. Any analysis of the situation is incidental and, if made at all, is made mentally and individually by the judges. The teachers are "rated" as good, bad, or indifferent, as worthy or unworthy of retention and promotion, according to the opinion of the one who judges them. There is nothing to tell what the judgment really means. No evidence is presented to support the final rating. The judge's opinion may be well grounded or not. As certain teachers under such a system declared, "The way to get promoted is to know your principal rather than your principles."

The dangers and disadvantages of such lack of method are obvious. The efficiency of the work must necessarily suffer when teachers are working to satisfy whims instead of working to attain worthy ends,

understood and set up by teachers as well as supervisors, or striving to please superior officers instead of working according to sound educational principles. The rating officer is safe if all the teachers are satisfactory and worthy of promotion, but what can he say if his judgment is called in question one way or the other, or if it disagrees with that of some other officer? There is no good evidence to give to the dissatisfied teacher or disagreeing officer. There is great opportunity for favoritism, and if partiality is not actually shown, the superintendent is in danger of being accused of it if he has nothing to show as a basis for his rating.

Moreover, one's general impression is not always to be trusted. We have evidence to show later that an officer's general impression may be modified when the teacher is studied in detail. Analysis reveals qualities of merit or demerit not realized before. The officer may be prejudiced for or against a teacher by some factor which is not vital to the teacher's efficiency. Justice to the teacher and the welfare of the school demand that the best be made of the teacher's possibilities as well as that deficiencies be discovered and corrected. "General impression" and the "indefinable something," looked for by many superintendents, can help but little in improving the teaching force.

Some superintendents, however, are firmly convinced that their personal general impression of a teacher is all that is necessary to place her correctly and that an analysis is worse than a waste of time. If no other purpose were served by rating than that of determining general efficiency or inefficiency, and if all schools were blessed with expert judges of teachers, we should not need analysis; general impressions would be enough. But it is important to know in what particulars teachers are superior or inferior if they are to be properly placed or helped. In judging handwriting it may be fairly easy for one to tell whether a particular sample is better or worse than another, but if the critic is to help the poor writer he must be able to point out specific points of deficiency. He must analyze the writing into slant and spacing and size and alignment and make his recommendations accordingly if they are to accomplish what they should. In helping poor writers, general impression is not enough. In the vastly more complicated problem of discriminating between the efficiency of teachers and in helping teachers where they most need help, general impression is very far from being enough.

Besides this, not all the school officers who are called on to pass judgment are expert judges of teaching efficiency. A schedule of qualities in the hand of the non-expert judge of teachers will not make him an expert but it will tend to make his judgments more adequate and uniform, and therefore more expert, than they would otherwise be, and will insure greater reliability. The expert will be developed by training and practice.

Analytical method.—In the rating schemes which attempt to analyze the teacher's efficiency and judge her in systematic fashion, one finds all degrees of complexity. Some have as few as two points to be reported on; while in others as many as 75 or 80 points are taken into account, analyzing the work most minutely.

Four general types of rating schemes can be distinguished in the hundred or more which we have collected.

1. Descriptive reports involving a written statement by the supervisory officer. Such a report may leave the supervisor free as to the points to note, or it may specify the points minutely. Thus, Oakland, California, requires Report on Teaching and Report on Discipline. In Hannibal, Missouri, the principal reports on four points, viz.: (1) Discipline, (2) Teaching Power, (3) Accuracy, Neatness, and Promptness of Record Work, and (4) Professional Spirit. Alameda, California, uses a descriptive blank with thirteen factors noted while the one reporting is aided by a list of questions under each point.

2. Racine, Wisconsin, and Middletown, New York, represent a second type in which a series of questions is asked. Most of the questions are answerable by "Yes" or "No." Some require a brief statement of fact.

3. A third type of report blank is used by Philadelphia, St. Louis, and a number of other cities. The teachers for a building are listed usually in order of general excellence. Opposite each name is placed some indication of the teacher's general efficiency and her grade in each of the few specified items. The St. Louis plan uses six topics: (1) Management of Children, (2) Instruction, (3) Attention to Details of School Business, (4) Scholarship, (5) Professional Interest and Zeal, (6) Personal Qualification. Each of these terms is defined on the back of the blank. The mark for each quality is to be the initial letter of one of the following words: Excellent, Good, Medium, Unsatisfactory.

A number of cities use a separate card for each teacher and a grade is set down opposite each quality of merit.

Dallas, Texas, presents a list of qualities with three or four descriptive adjectives following each. Those adjectives which do not describe the teacher are crossed out.

The classroom instruction card, published by the New York Bureau of Municipal Research, is widely used "as a scale for self-measurement by teachers and as a memorandum for supervisors." The card calls attention to nearly a hundred details, usually giving the critic alternative replies to be checked.

4. A fourth type is that in which definite numerical values are given to the various qualities, and subtractions made from the maximum value of any quality in proportion to the deficiency. One of the simplest of such score cards is issued by the Department of Public Instruction of the state of Indiana. The Indiana scheme has three headings:

Teaching power	given	45	points
Government	"	35	"
General characteristics	"	35	"

We have at hand 10 such schemes, varying in complexity from this simple one to that proposed by Professor Elliot of Wisconsin which distributes 1,000 points over 42 separate qualities of merit.

Summary of rating schemes.—The qualities emphasized: Any attempt to summarize the qualities found in the many schemes proposed can be only partly successful, owing to the diversity of meaning for the same terms and difference in expression. An examination of 50 rating schemes revealed 150 factors which, however, were not all different. Thus we find six different ways of expressing Instructional Skill and ten different statements for Discipline. There is much overlapping among the qualities. As well as we could, we have combined the 150 factors and reduced them to 53, the most important 25 of which we present in Table I.

The method of marking: The terms in which teachers are reported or graded on single items, or terms in which the "efficiency grade" is given, have been obtained from 68 cities. The character of the marks and the frequency of each are given in Table II and following that the number of ranks used and their frequency.

Discussion of rating schemes.—Now that we have in mind the general characteristics of the rating schemes as employed at present, let us see what are the advantages and disadvantages of these devices and the difficulties presented by this method of measuring teaching efficiency.

The descriptive method of reporting a teacher's efficiency has the advantage of giving the critic great freedom in what he shall report

TABLE I

Qualities	Frequency
Discipline	49
Instructional skill	30
Scholarship and education	29
Co-operation and loyalty	30
Plan and method	28
Personality	20
Professional interest	16
Manner	15
Voice	14
Daily preparation	13
Accuracy and promptness	12
Professional training and preparation	12
Attitude toward criticism	12
Appearance	11
Health	11
Routine	11
Teacher's growth and improvement	10
Attitude toward work	10
Attitude toward pupils	10
Character	9
Tact—sympathy	9
Skill in questioning	9
Personal influence	9
Housekeeping	8
Results	8

but is wasteful of time and energy in the large amount of clerical work involved. Large freedom in reporting is not an advantage to all judges of teachers. The value of the report depends too much upon the supervisor's ability to bring to mind all the points which should be reported, and upon his ability to express himself easily and accurately. Unless the points on which report is to be made are carefully specified,

the one reporting may easily emphasize some one point to the total exclusion of others equally important. In addition to the labor involved in making such a report and especially a large number of them, diffi-

TABLE II

Character of Mark	Frequency
Excellent, Good, Medium, Fair, Poor	1
Excellent, Good Fair, Poor	10
Excellent, Good, Poor	1
Satisfactory, Unsatisfactory	2
Below Average, Average, Above Average	1
Satisfactory, Fair, Not Satisfactory	1
Excellent, Good, Inefficient	1
Excellent, Good, Fair, Unsatisfactory	3
Excellent, Good, Fair, Poor, Very Poor	1
Excellent, Good, Medium, Unsatisfactory	2
Excellent, Very Good, Acceptable, Fair, Unsatisfactory	1
Excellent, Good, Medium, Poor, Failure	1
Superior, Strong, Good, Fair, Failure	1
Excellent, Very Good, Good, Fair, Poor, Very Poor	2
Excellent, Very Good, Good, Fair, Poor	3
Excellent, Good, Fair, Poor, Unsatisfactory	1
Good, Fair, Poor	1
Superior, Excellent, Good, Moderate, Unsatisfactory, Very Unsatisfactory	1
Perfect, Excellent, Good, Fair, Poor, Very Poor	1
A, B, C	4
A, B, C, D	6
A1, A, B, C	1
Adjectives	1
Percentages (values distributed)	10
Description	1
Letters, *ad lib.*	1
Answers to questions	1
Figures (1, 2, 3, etc.)	7
Number of schemes using:	
2 ranks	2
3 ranks	11
4 ranks	24
5 ranks	12
6 ranks	4
7 ranks	1

culties are encountered when the reports are made use of later. They have to be read as laboriously as they were written. There is no way in which they can be summarized quickly and accurately. There is no way in which one teacher can be compared with another with any assurance.

Reports giving answers to questions are easier to make out than the purely descriptive type since they require less time and effort for composing and writing. They are also more easily read. If the answers to the questions or the rank allotted to the teacher in a given quality are expressed by symbols such as letters or figures, still more time is saved. In each case, however, the symbols have to be translated into meaningful terms by the one using the report afterward. The difficulty of quick and accurate summation to obtain a general efficiency grade still presents itself.

Rating schemes which assign definite values to the various qualities considered are easily summated but have more serious defects of another kind. The difficulty here lies in the values and in the use made of them. First, doubt arises as to the validity of the values assigned. It is obvious that qualities of merit are not all of equal value, but who is to say how much one quality is worth in relation to general merit? Who knows whether Instructional Skill is worth ½ or 2 or 5 or 25 times Discipline? It is perfectly legitimate for the individual superintendent or the superintendent and his supervisors to fix upon a scale of values for the factors in question, but it would be the merest chance if the values assigned in this arbitrary manner by one man or a group of men were the true values and gave the proper weight to each factor. It is not at all likely that two men or two school systems would assign the same set of values unless one copied from the other. This complicated problem of the relative value of qualities of merit will be considered at length later in our study.

Secondly, the process of "cutting" for deficiencies is not sufficiently regulated in many cases. The values are assigned to the separate qualities but the one using the score card is not given any instructions as to how much shall be taken off if the deficiency is large or small. It will make the greatest difference whether the judge uses the whole of the scale or only the top of it. Thus if the maximum values are those of the Indiana score card and the teacher is barely passable, which one of the following scores shall she be given?

	Maximum Values	Passing Mark 90	Passing Mark 75	Passing Mark 50
Teaching power.....	45	41	34	22
Government.....	35	32	27	18
General characteristics...	20	18	15	11
	100	91	76	51

If the Indiana rule were applied she would probably receive the grade of 91, since grades above 90 are satisfactory. If 75 were the passing mark, then her grade might be cut to 76. If the whole scale were used and failure were scored down near zero, then 51 would probably be the grade assigned. Unless definite rules are established and approximately equal cuts are made for approximately equal deficiencies, ratings by different judges are not comparable and cannot be mutually understood.

The difficulty cited above is avoided in some instances by accompanying the scale of values by a scale of cuts to be made. Thus one plan in which the maximum for Teaching Skill is 20, designates that if Poor the teacher be given 12, if fair 14, Medium 16, Good 18, and if Excellent 20.

As we have said, numerical scales of this kind are easily reduced to a success grade, but they are not at all easily read in detail, and the estimate of a given detail of the teacher's work is often more necessary than a general success grade. To determine what a teacher is worth in any one particular, the grade given the teacher on that point must be compared with the maximum grade possible and then one must reflect whether the subtraction for deficiency is large or small. Unless the subtractions to be made have been prearranged and specified, the marks on individual points may be very largely meaningless.

Another criticism of rating schemes has to do with the choice of the terms which form their basis. In response to the demand for brevity, the list may be made very short, in which case, in order to cover the ground, the terms have to be very general. The value of the terms, in analyzing the teacher and her work, becomes less as the terms become more general and more inclusive. Vagueness and indefiniteness are faults too prevalent in rating schemes. The need is for terms which are definite and precise.

Indefiniteness and lack of precision can be overcome largely by careful definition, but comparatively few of the plans we have examined make use of definition.

The greatest obstacle to the operation of rating schemes of whatever kind is the insurmountable personal factor. By the very nature of the case the judging of teaching efficiency is a personal process and one which can by no means be done in a purely mechanical way. Even if we knew all the factors entering into teaching efficiency and had a perfect objective measurement for every factor, persons and personal judgment would not be eliminated. Nor is it necessary or desirable that they should be eliminated. The necessary thing is to eliminate *mere* personal *opinion*, to make sure that all the elements of teaching efficiency, so far as we know them, are given proper consideration and weight in the formation of the final judgment, and that every judgment be based on a sure foundation of facts and sound educational principles. It is further necessary that the rights of the teacher be so safeguarded by careful control and guidance of the process of judging efficiency, that no teacher may have grounds for complaint that the rating is prejudicial against her. At the same time, the good of the school must be equally protected by making it impossible for the rating officer to escape trouble or inconvenience by rating all teachers high or without discrimination.

Use made of teachers' ratings.—Teachers are rated principally for the following reasons: (1) for the private information of the superintendent; (2) for the purpose of furnishing a basis for salary adjustment, or to control salary adjustment; (3) for use in connection with other factors, such as length of service, examination, or special work to determine promotion; (4) to improve the teachers in service.

1. A superintendent with a large body of teachers cannot know them all in all details as he would like. His rare observation of individual teachers must be supplemented by reports of some kind from principals and supervisors. Some superintendents, however, declare that any attempt to use the ratings officially causes jealousy, hard feeling, and trouble generally because of the teacher's unwillingness to accept the rating, especially if it is low. This is declared to be even more true when the ratings determine in whole, or in part, the salary which the teacher receives.

2. In spite of the difficulties involved, the state of Indiana and numerous cities have tried to make the connection between efficiency as determined by some method of rating and salary.

The minimum-salary law of Indiana requires that the salary be based on length of service and the grades made for the certificate. "The

amount of salary per day is determined by multiplying a certain number of cents by the general average on the highest grade of license held by the teacher at the time of contracting. The number of cents to be multiplied is 2½ for beginners, 3 for those having had one year of experience, and 3½ for those having had at least three years of experience. After the teacher has taught one year, the success grade enters into the general average."[1]

A circular of information from the office of the superintendent of schools of Philadelphia indicates the relation of rating to salary in that city.

CIRCULAR OF INFORMATION

As part of the revision of the salary schedule effective January 1, 1913, when the salaries of teachers were increased, the Board of Public Education adopted the following provision:

The annual increases heretofore given to kindergarten teachers, teachers of primary grades, male teachers in grammar grades exclusively, male teachers of woodworking in the seventh and eighth grades, all other teachers of grammar grades exclusively, special classes, and elementary manual-training classes, shall cease at the expiration of the fifth year, unless the teacher who is completing the fifth year shall be certified to the assistant district superintendent of the appropriate district by the principal or supervising principal of the school as competent, and such district superintendent shall submit the same to the Superintendent of Schools for presentation to the Committee on Elementary Schools. [Rule XXXII.]

The ten annual increments provided in the schedule are thus divided into two series. The first series includes four increments, and the second series, six increments. Advancement within each series is automatic for all teachers holding permanent certificates. The rule quoted above means that no teacher can be advanced to the second series unless such teacher is certified by the principal as "competent" and such certification receives the approval both of the district superintendent and the Superintendent of Schools.

By action of the Committee on Elementary Schools, a teacher in order to be regarded as "competent" within the meaning of this rule must have received a rating of at least 80 per cent.

Teachers who, upon becoming eligible for consideration for advancement into the second series of annual increments, fail to qualify for same, will be duly considered for such advancement at the end of each subsequent year.

M. G. BRUMBAUGH, *Superintendent*

October 10, 1913

[1] W. C. Ruediger, *Agencies for Improvement of Teachers in Service.*

Superintendent Monroe, of Muskogee, Oklahoma, in his report for 1912–13 has this to say as to the use made of the rating blank used there, and regarding the success of its application to salary regulation:

Having once been recommended for a position in our schools by the committee and elected by the Board, teachers are practically secure in their positions as long as they render efficient service. By a system of efficiency grading teachers are automatically re-elected or dropped in accordance with the estimate of success in teaching as determined by the ratings of the supervisory officers of the Board. In accordance with the standards adopted teachers are rated at the end of the school year into classes A, B, C, and D. Those rated in the D class are dropped without question, those in the C class are dropped or conditionally re-elected, and those in the classes B and A are re-elected, the latter receiving a slightly larger increase in salary than the former. This system assures the reappointment of teachers solely on the basis of merit and efficiency. Church preference, politics, and personal pull are not permitted in any way to influence the election of a teacher or to maintain an incompetent teacher in our schools. Under this system those engaged in the supervision are responsible if unworthy or incompetent teachers are retained in the Muskogee schools. Some of our best teachers leave us every year because we are unable to retain their services at the compensation we offer, but aside from this the system inaugurated and maintained by the present Board of Education is gradually improving the teaching force of the schools and will continue the improvement so long as it is maintained.

The "Schedule of Qualifications and Salaries" of the Board of Education of Decatur, Illinois, sets forth the requirements for their teachers and the annual increments for the various classes of teachers, and then goes on to say:

Advancement from year to year until the maximum is attained shall depend (1) upon successful experience (not falling below 80 and not falling below a grade once held) evinced by the combined quantitative judgment of the supervisory force, such judgment to be expressed in written figures at least once per year, and (2) upon the continued professional growth through meeting the requirements imposed by the Board of Education (to be announced in bulletins or syllabi from time to time) in matters of study, attendance upon meetings—local, county (the teachers' institute), and state, etc.

A rank once attained may be lost if the teacher retrogrades in success or fails to evidence professional growth both in spirit and in the mastery of the study prescribed by the Board of Education.

A teacher who changes the class to which she belongs by adding to her equipment shall begin on the schedule in the new class which she enters at the

salary she drew in the old class, provided the new salary shall always be equal to or in excess of the old salary. Only official evidence of credits earned in an institution shall be considered in determining a teacher's class and her advancement in the same.

The "Salary Schedule" (sec. 4) of the Hannibal, Missouri, public schools, provides that a teacher "may not be advanced in salary if the principal's semiannual report on the last year's work done and the Superintendent's estimate leave room for doubt as to her strength in discipline, teaching, and professional spirit."

Superintendent C. C. Green, of Beaver Falls, Pennsylvania, reports the successful use of a rating scheme in controlling salary increase. The teachers there are divided into three classes, according to certificates held and experience. There is an automatic increase, for satisfactory service, of $5.00 in each class, up to a maximum.

3. Teachers' ratings are seldom considered alone in adjusting salary. They may be combined with length of service as in the practice of Decatur, Hannibal, and Beaver Falls described above, where there are annual increments of salary up to a maximum, provided efficiency is shown by the ratings to be satisfactory.

Charleston, South Carolina, has eight grades in the salary schedule for its teachers. Advancement from Grade I to Grade VII is automatic, provided the teacher's work is reported as satisfactory. If the rating is unsatisfactory, the teacher remains in the same group another year, after which she may be dropped if still unsatisfactory. Promotions from Grade VII to Grade VIII, the highest salary group, are made "on the recommendation of the Principal and Superintendent, for special efficiency, or when put in charge of a class in the highest grade of the Elementary School. In the promotion for special efficiency, the teacher prepares a paper on a subject assigned by the Superintendent in lieu of standing an examination." A schedule of qualities is the basis of the principal's report. "The final rating is given on a personal conference between the Principal of the school and the Superintendent, and in the case of teachers in primary grades, after consultation with the Primary Supervisor. The tests given by the Superintendent during the year are also considered in the report on efficiency."

In Springfield, Ohio, an annual increase of $50.00 is allowed to each elementary teacher, until the salary of $750.00 is reached, subject to the following requirements: (*a*) Efficiency of classroom work must be

rated as Fair or higher, to be granted each of the first three annual salary increases; and Good or higher, to be granted the fourth and all subsequent increase. (*b*) With certain exemptions, each teacher is required to make a study each year of one book in psychology or some phase of pedagogy; one general work on the subject-matter of some school study; and some book of literary and cultural nature. (*c*) Exemption is made in whole or part for summer study in normal school or college, or for work done in a study club.

Columbus, Georgia, provides for annual increase up to a maximum. Further increase is according to the following regulation:

PROMOTIONS

After any one of the class of assistants has served one year at the maximum salary of his class, he may have a further advance of $75.00 in the yearly salary by receiving an efficiency rating of not less than 85 per cent and passing satisfactory academic and professional tests. Notice in writing of the desire for such promotion must be given the Board one year in advance. The Superintendent and Principal of the school shall then make careful inspection of the work of such teacher and make to the Board, for the purpose of record, four reports each at regular intervals during the year. These reports will show the teacher's practical efficiency in management of children, instruction of class, and attention to school business, and will also show his professional qualities of scholarship, professional interest and zeal, and strength of personality. At the end of the year such teacher shall submit a paper of not less than 1,500 words on one of several professional topics assigned by the Superintendent and satisfactorily discuss the paper with the Board of Examiners, and shall make good an examination in three professional subjects and two academic subjects other than his specialty, if any.

Having met these requirements, the increase of $75.00 in his annual salary shall continue through a period of four years, after which another advance of $75.00 in the yearly salary may be had in like manner upon an efficiency rating of 90 per cent and similar tests on advanced subjects.

4. It is no doubt the intention of all the cities rating their teachers that the scheme should be a means of improving the teachers in service—directly, by pointing out weaknesses, or indirectly, through the control of the salary increase. Some cities use rating schedules only for the avowed purpose of improving their teachers. The score card of the New York Bureau of Municipal Research is one that has been widely used for this purpose (see Appendix, p. 82). The card is given to a

teacher that she may rate herself and thus, if she is honest with herself, discover points for improvement. The same scheme and others are used as a basis of supervisory criticism. The teacher knows what she is being graded on and can more easily come up to supervisory standards. Indeed, no rating blank should be used which cannot be put into the hands of the teacher. The ratings ought to be of such a character that they could be discussed with the teacher.

CHAPTER II

STUDIES OF QUALITIES OF MERIT AND THEIR VALUES

Discussions of the "ideal teacher" are numerous in educational literature. Every educational essayist has described that mythical creature in glowing terms. The pages of the reports of the National Education Association are full of her virtues. There is much of inspiration and suggestion in these discussions but little or nothing of scientific value, little of which a superintendent could make practical use. Each writer or speaker has described the qualities as they appeal to him, usually emphasizing one or two virtues to the exclusion of others. The great bulk of the writing on the subject of teaching merit has been of the subjective, a priori type without any basis beyond the theory and experience of the one who was writing.

Some work has been done to determine qualities of merit and their relative value in more objective and impersonal ways. There is a movement toward analysis of the qualities of teachers as they are, instead of a priori discussions of what they ought to be. If some adequate analysis can be made of the best teachers we now have and if we can determine, even roughly, the relative value of qualities of merit in them, we have advanced a little toward the stating of efficiency in scientific terms. It is our purpose at this point to examine some of these studies as preliminary to further work along this line.

The earliest investigations of this kind were built upon what boys and girls had to say about their best teachers and the teachers who helped them most. We review here two of these studies.

"*Characteristics of the Best Teacher as Recognized by Children*" (Kratz[1])

It was the purpose of this investigation "to learn something of the children's ideas as to what constitutes the most helpful teacher, and what are the chief characteristics of the best teacher."

The plan was to ask the pupils of a room to recall all their teachers as fully as they could, and single out the one who helped them most. They were then asked the following questions: (1) "In what way did she help you?" (2) "Do you recall any special word or act of hers which greatly helped you? If so, what is it?" (3) "Will you write, in half

[1] H. E. Kratz, *Studies and Observations in the Schoolroom* (Boston: Educational Publishing Co., 1907), chap. v.

a dozen sentences, a description of the best teacher you have had, without naming her?"

There were brought together 2,411 papers from Grades II–VIII. A few of the most common characteristics are given in Table III.

TABLE III

	No.	Helped in Studies	Personal Appearance of Teacher	Good or Kind	Patient	Polite	Neat	Cross
		Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
II	404	100	59	53	2	2	2	1
III	581	100	57	52	4	5	8	2
IV	511	95	68	63	9	5	11	2
V	347	85	50	67	16	7	6	3
VI	245	55	41	55	14	7	4	5
VII	157	40	74	45	14	2	9	2
VIII	166	39	64	38	22	3	11	0
Total	2,411	.....	58	55	9	7	4	2

In answer to the first question, "How did she help you?" the lower grades mentioned such things as, "to be good," "to study," "to like school," "to be polite," and the like, while the higher grades said, "to observe," "to control myself," "to strengthen my character."

The question about special acts of the teacher which helped the pupils brought out "a deep sense of appreciation of words of encouragement and commendation," and appreciation which was manifested "to a greater degree than anticipated in higher grades."

"In every grade, except one, more than half of the pupils gave prominence to the teacher's dress and personal appearance."

Patience was highly appreciated. Politeness was frequently referred to. Neatness of the teacher's dress and also of her desk was a trait many recalled.

Mr. Kratz gives numerous quotations from papers of individual pupils which are interesting as showing how hard it is for teachers to conceal their failures and shortcomings from the children. The study has in it much food for thought for careless teachers as well as for those who would be favorites with grade children.

The investigation is of little importance for our present purpose of determining values of qualities of merit but it is suggestive and a step in the right direction.

"*The High-School Teacher from the Pupil's Point of View*"(Book[1])

Mr. Book's material for this discussion of the high-school teacher came from 1,067 Senior high-school students who were asked by their teacher of English to write a composition on "High-School Education." One of the points to be discussed freely was "some sympathetic teachers I have had in the high school, or the reverse." The sympathetic teacher is defined in the pupil's own words as "the favorite teacher," "the teacher best liked," "the one who is respected and loved by all," and in other similar terms. What the pupils say about their teachers is given under three heads: (1) their character, (2) their qualifications, (3) what they did.

1. The favorite teacher's character:

One hundred and forty-four said their favorite teacher was *kind*, *forgiving*, and *generous*. These qualities were most often emphasized.

One hundred and twelve students said more emphatically that their most helpful teacher was *pleasant*, *cheerful*, *good-natured*, *happy*, *even-tempered*, and *sociable*.

A third group of adjectives, used to describe 104 of the ideal teachers included the following: *patient*, *considerate*, *thoughtful of the feelings of their pupils*, *reasonable*, *not cranky*, *not over-particular* or *unreasonably strict*.

"Fifty-nine pupils especially liked teachers who were *firm*, *decisive*, *business-like*, and *strict*.

"Forty-six of the sympathetic teachers discussed [all described by girls] were said to be especially *inspiring*, *easy to approach*, and the like."

"Twenty-six students mentioned the fact that their favorite teacher was *serious*, *earnest*, *rather dignified*, *unassuming*, and *quiet*."

"A few teachers were said to be *good*, *polite*, *courteous*, or *refined*. *Hypocrisy* is especially disliked while *sincerity* is highly commended."

"Lastly the sympathetic teacher was described as wholly *unselfish* and *self-sacrificing*."

2. Qualifications described:

(1) The favorite teacher *understands boys and girls*.

(2) Another qualification from the point of view of the students is that the teacher be *enthusiastic*, *energetic*, *young*. By *young* the pupils do not mean so much an age distinction as one of mental attitude. Being *young* means being enthusiastic, full of life, up to date.

(3) To be recognized as an ideal teacher one must be *interested in work*.

[1] W. F. Book, *Pedagogical Seminary*, XII, 239–88.

(4) Another essential qualification is *scholarship*, but one must not be a narrow specialist.

(5) No definite *sex qualification* is made.

(6) Neither was any *appearance qualification* made. This is in contrast with Kratz's study of grade children, in which it was found that neatness and appearance were important qualifications. Says Book, "High-school pupils seem not only to appreciate but to be accurate judges of a teacher's real worth."

3. What the favorite teacher does:

"Two hundred and eleven teachers were chosen as favorites chiefly because they were always ready and willing to give their pupils the right sort of encouragement."

"In all his dealings and intercourse with his pupils the favorite teacher is *reasonable, fair*, and *just*. Justice received special emphasis." The teacher allows for individuality.

"The pupils' favorite teachers have confidence in their students, put them on their honor, believe in them, and trust them."

The pupils like a teacher who "takes an interest" in them outside of school, as well as in.

The favorite teacher makes the class work pleasant and interesting, by clear explanations, originality, much free discussion, and by his attitude and manner.

In general, the author's conclusions are as follows:

1. Pupils demand constant direction and encouragement, which only teachers with certain definite qualifications and qualities of character are able to give.

2. The common virtues and the more fundamental qualifications are the ones which most appeal to high-school students.

3. The teacher's ability to understand boys and girls is of primary importance.

4. Boys and girls require different treatment but in the main they like teachers with much the same characteristics.

5. Sex is not a vital factor.

There is no hint in these two studies of any possible quantitative relation between the qualities of merit. The discussions are all in general, qualitative terms such as the children suggest. Their value lies in the fact that they make an effort to get at the real qualities of real teachers and do give some basis for action. The studies are limited by the fact that the children whose impressions they summarize are not able to analyze the teacher very minutely or to

give anything beyond certain personal characteristics of their "favorite teacher."

The fuller analysis must be made by superintendents and others who know teachers more intimately on the professional side and who are able to state in more exact terms the differences they find in teachers. Furthermore, the statement that one quality is more valuable than another leads to the question, How much more? It is necessary to introduce quantitative relations.

The later studies have tried to do this by appealing to superintendents for information and attempting to determine the quantitative relations by statistical method. The success of these efforts will be indicated by the investigation which we review below.

"Qualities of Merit in Teachers" (Ruediger and Strayer[1])

These investigators had a number of principals and superintendents rank their teachers, first according to General Merit, and then according to each of ten possible factors of General Merit. They secured information as to the grade taught, preparation and experience of each of the teachers ranked. Returns from 26 schools were used.

Correlations between General Merit and each of the specific qualities of merit were made by the method of Woodworth's Percentage of Displacement. The results are condensed in Table IV which is rearranged to give the qualities in what appears to be the order of their importance.

TABLE IV

General Merit	No. of Cases	Range	Median	Average	M.V.	R.E.	Pearson
1. Control or ability to keep order	25	0–100	22	22	12	11	56
2. Teaching skill; method	26	0– 70	17	23	15	13	54
3. Initiative or originality	26	4– 53	25	25	11	8	50
4. Strength of personality	26	0– 70	25	27	13	11	46
5. Progressive scholarship or studiousness	24	0– 53	30	28	12	11	44
6. Ability to carry out suggestions	24	0– 50	25	29	10	10	42
7. Accord between teachers and pupils	26	0– 60	33	31	10	10	38
8. Experience in years	25	10– 60	29	32	11	8	36
9. Social factor outside of school	23	10– 66	36	36	11	7	28
10. Personal appearance	24	10– 61	44	40	10	7	20
11. Health	18	6– 67	50	48	10	7	4

[1] *Journal of Educational Psychology*, I (May, 1910), 271.

The following manipulation of the correlation coefficients has been suggested to indicate the values of the factors relative to each other.[1]

TABLE V

General Merit	Control	Teaching Skill	Initiative	Personality	Studiousness	Carrying Out Suggestions	Accord	Experience	Social	Appearance
Teaching skill	1.04									
Initiative....	1.12	1.08								
Personality..	1.21	1.17	1.08							
Studiousness	1.27	1.23	1.13	1.05						
Carrying out suggestions	1.33	1.28	1.19	1.09	1.05					
Accord.....	1.47	1.42	1.31	1.22	1.16	1.10				
Experience..	1.55	1.50	1.39	1.28	1.22	1.17	1.06			
Social.....	2.00	1.92	1.78	1.64	1.57	1.50	1.35	1.28		
Appearance .	2.80	2.70	2.50	2.30	2.20	2.10	1.90	1.80	1.40	
Health.....	14.00	13.50	12.50	11.50	11.00	10.50	9.50	9.00	7.00	5

It will be noted that Control and Teaching Skill are the most important items in this list, while the physical qualities of Health and Appearance stand lowest. Whether or not the qualities stand in the exact relation shown by the table is of course extremely doubtful. Only extended and prolonged experimentation can establish it. That such a relation may be found, however, is indicated by this and other studies.

The value of experience in modifying teaching ability is discussed by Professor Ruediger, as follows:

The positive correlation between length of service and general merit is significant. The correlation is indicated by several other comparisons that we have made. The teaching experience of the 204 teachers from whom data were supplied under this head ranged from a fraction of a year to 34 years, with an average of 10 and a median of 8; 25 per cent had taught less than 5 years, while 26 per cent had taught over 14 years. The average and the median number of years taught by the teachers ranked first were, respectively, 14 and 10.5 years, and for those ranked second, 12 and 10.5 years. No teacher ranked either first or second had taught less than 5 years, and only 4 per cent had taught more than 25 years. The average number of years taught by those ranked lowest was 8 years and by those ranked second lowest 9 years. The medians for these were, respectively, 4.5 and 6 years. When the two

[1] *School Review Monographs*, No. V, p. 18.

oldest teachers are removed from the lowest group, the average drops to 6 years; and when the oldest is removed from the second lowest group, the average drops to 8 years. These three teachers had taught, respectively, 24, 30, and 32 years; 70 per cent of the teachers in the first rank, 60 per cent of those in the second rank, 40 per cent of those in the second lowest rank, and only 30 per cent of those in the lowest had taught 10 years or more. This indicates either that teachers keep on improving and passing to higher ranks for at least 10 years or that the poorer teachers are gradually eliminated from the service. Both factors may play a part. From the figures as a whole one may infer that a teacher in the grades reaches first-class efficiency in about 5 years, that he maintains this efficiency for about 20 years, and that after about 25 years of service he begins to decline.[1]

"Qualities of Merit in High-School Teachers" (Boyce[2])

Following the above-named study of the elementary teacher by Ruediger and Strayer, the writer made a similar investigation in the secondary field. In this case a list of 21 possible factors of teaching efficiency was presented to over 200 superintendents and high-school principals, with the request that they rank their high-school teachers, first according to General Merit and then according to each of the separate qualities of merit. Reports from 27 schools were made use of.

The method of correlation used in determining the relation of each quality to General Merit was that indicated by the formula:

$$r = \cos \frac{\sqrt{bc}}{\sqrt{ad}+\sqrt{bc}}\pi$$

in which a equals the number of cases in which individuals are above the median rank in both of the qualities compared; b equals the number of cases in which individuals are above in the first quality and below in the second; c equals the number of cases in which the individuals are below in the first quality and above in the second; d equals the number of cases in which individuals are below in both qualities.

In those classifications where the Pearson coefficient has not been worked out, the teachers were divided arbitrarily into three classes, Good, Medium, and Poor. By Good is meant those ranked first or

[1] *U.S. Bureau of Education Bulletin No. 3*, 1911, "Agencies for the Improvement of Teachers in Service."

[2] "Qualities of Merit in Secondary School Teachers," *Journal of Educational Psychology*, March, 1912.

second; by Poor, those ranked last or next to last; by Medium, all others between these two. Because teachers are ranked last or next to last does not necessarily mean that they are really poor teachers. It simply means that of all the teachers with whom they were compared they were least good. It seemed safe to make this classification because in any one quality it is quite likely that one or two teachers would be prominent either for the presence or absence of that quality, while it might be more difficult to distinguish between the others.

In regard to the relation of sex to teaching efficiency we had data on 154 male and 250 female high-school teachers. Comparisons are very slightly in favor of the women. It was possible for 62, or 40 per cent, of the men to rank first or second, and only 14 per cent of them were so ranked; while out of a possible 24 per cent of the women, 16 per cent ranked in the first two classes. The Pearson coefficient, however, shows no relation between sex and teaching efficiency in this body of high-school teachers.

The Pearson coefficient between General Merit and Experience was 0.43 with a P.E. of 0.053. No teacher ranked first or second who had less than 3 years of experience. When the years of experience are grouped by fives and the distribution made we have Table VI.

TABLE VI

Years	No.	Good		Medium		Poor	
		No.	Percentage	No.	Percentage	No.	Percentage
1- 5.....	160	15	9.3	109	68.1	36	22.6
6-10.....	138	25	18.1	96	69.5	17	12.4
11-15.....	65	15	23.0	42	64.6	8	12.4
16-20.....	29	6	20.6	19	65.5	4	13.9
21-46.....	28	6	21.4	20	71.4	2	7.2

It is to be noticed that there is a decided falling off in numbers between the second and third groups. Seventy per cent of all are in the first two groups. The increase in efficiency is very great from 1 to 10 years, a little less decided from 10 to 15, and efficiency as indicated by the percentage of good teachers falls off slightly from 15 to 46, but the medium group increases in that time.

The relation of the specific qualities of merit to General Merit is shown in Table VII.

The quality which ranks far above all others is Instructional Skill with its correlation of 0.90. Next in order come Results and Stimulation of Individuals with their coefficients of 0.85 and 0.80, respectively. These three, with Intellectual Capacity 0.71 and Discipline 0.67, seem to be the single qualities deemed most important by supervisors, and are the qualities, perhaps, which are most likely to be determining factors in a high-school teacher's success; all the other qualities, except

TABLE VII

	Rank	r	P.E.	No.
General Merit and Physical—				
1. General appearance	21	0.36	0.059	343
2. Health	22	.18	.062	311
3. Voice	16	.50	.059	343
4. Energy and endurance	15	.51	.059	343
Moral—				
1. Self-control	13	.52	.06	326
2. Sympathy—tact	17	.45	.059	343
3. Adaptability	11	.59	.06	330
4. Sense of humor	19	.44	.059	343
5. Fair-mindedness	18	.45	.062	310
Administrative—				
1. Initiative	9	.62	.06	330
2. Executive capacity	10	.62	.06	330
3. Co-operation	6	.66	.061	320
Dynamic—				
1. Intellectual capacity	4	.71	.06	328
2. Instructional skill	1	.90	.059	343
3. Governmental skill (discipline)	5	.67	.059	343
4. Studiousness	7	.65	.06	328
Achievement—				
1. Success of pupils (results)	2	.85	.059	343
2. Stimulation of individuals	3	.80	.06	325
3. Stimulation of community	14	.52	.066	276
Social Spirit—				
1. Interest in life of school	8	.64	.062	310
2. Interest in life of community	12	.57	.064	289
Experience	20	0.43	0.053	421

General Appearance and Health, show high correlation with Teaching Efficiency. As a group the physical qualities rank lowest and the dynamic and achievement qualities highest. Superintendents are evidently looking for results. It will be noted that Experience ranks third from the last, which may indicate that Experience is not always so important as is maintained. The correlation of the moral qualities and the physical qualities of Voice and Energy are high, but when compared

with the other qualities they seem to be less important. The low correlation of Health indicates either that good teaching is very hard on those engaged in it or that teaching does not attract a very strong class of people into its ranks—or that the disadvantage of relatively poor health may be overcome by exertion.

When we compare these results with those from Ruediger and Strayer's investigation of elementary teachers we find points which tend to confirm the results of both, and yet, if the findings in the two cases can be taken as typical of elementary and secondary teachers, there are differences which show some different conditions in the two.

All of our coefficients of correlation in the present study are higher than the corresponding coefficients of the earlier study. Thus our highest correlation is 0.90, theirs, 0.56; our lowest is 0.18, and their lowest, 0.04. This difference may be due to method of correlation, or to actual difference between the relation of these qualities to Merit in high-school and elementary teachers, though such a great difference is unlikely.

The quality which had highest correlation with teaching efficiency in elementary teachers was Discipline, with Instructional Skill and Initiative ranking second and third. The coefficients of Instructional Skill and Discipline were respectively 0.56 and 0.54 in their study, and 0.90 and 0.67 in the present investigation, showing the much greater relative importance of Discipline in the grades. Health and Appearance ranked lowest with elementary teachers, as they did with high-school teachers.

In the matter of Experience there are some differences, but the results tend to the same conclusion, namely, that Experience is an important factor in modifying teaching ability. No elementary teacher ranked first or second with less than 5 years of experience. Among high-school teachers 3 years was the minimum for good teachers. The average experience of elementary teachers for the first and second classes was 13 years, and for the last two classes 8.5 years. The average experience of high-school teachers for these corresponding groups was 11.8 years, and 6.39 years, respectively. The averages for the totals were 10 years for grade teachers and 8.96 years for those in high school. All of which would seem to show that elementary teachers remain in the profession longer than high-school teachers. This is shown also by the fact that of the elementary teachers 25 per cent had taught less than 5 years, and

26 per cent more than 14 years, while of the high-school teachers 39 per cent had taught 5 years or less, and only 13.9 per cent more than 15 years.

Little direct comparison can be made as to preparation. It is noticed, however, that college graduates are predominantly the best high-school teachers, but are not particularly successful in the grades.

STUDIES OF CAUSES OF FAILURE IN TEACHERS

The problem of relative value of qualities of merit may be approached negatively, that is by a study of teachers' failures. When teachers fail it is likely to be at those points where pressure is greatest. The teacher is weak where she should be strong. Consequently a list of qualities of merit would have a corresponding list of qualities of demerit. A study of failures may be as illuminating as a study of virtues.

We have at hand reports of two such studies—one, of the failures of elementary teachers and the other a like study of high-school teachers. Miss Moses[1] in 1912 obtained from 76 school systems the causes of failure among high-school teachers during the preceding academic year. The classification of causes, together with the frequency of each, appears in Table VIII.

TABLE VIII

Rank	Causes of Failure	Number of Failures	Percentage of Total
1.....	Poor instruction.....	43	20.97
2.....	Weakness of personality.....	35	17.07
3.....	Lack of interest in work.....	30	14.53
4.....	Weakness in discipline.....	26	12.68
5.....	Lack of sympathy.....	20	9.75
6.....	Inability to co-operate.....	14	6.82
7.....	Unprofessional attitude.....	12	5.85
	Weakness in knowledge of subject-matter...	12	5.85
8.....	Disloyalty.....	7	3.41
9.....	Immorality.....	4	1.95
10.....	Poor health.....	2	0.97
	Total.....	205	99.85

The qualities lacking in these teachers who failed cannot be compared throughout with the qualities found to be most important by our

[1] *School and Home Education*, January, 1914.

own study of high-school teachers, but where comparison is possible, the order is found to be practically the same.

In a similar manner a study of the causes of failure of elementary teachers by Mr. Sherman Littler[1] parallels the Ruediger and Strayer results reported above. Mr. Littler makes the following partial comparison of the results in the two studies:

Qualities of Merit (According to Ruediger and Strayer)	Reasons for Failure
1. Discipline	1. Poor Discipline
2. Teaching Skill	2. Weak Personality
3. Initiative	3. Lack of Teaching Skill
4. Personality	4. Lack of Interest
5. Studiousness	6. Lazy—No Daily Preparation
6. Follow Suggestions	7. Failure to Co-operate
Last—Health	14. Health

In each study, health seemed to have little weight in determining the success or failure of elementary-school teachers.

Investigations tending to establish in an accurate way the qualities into which teaching efficiency is to be analyzed and the actual relation which each of these qualities bears to teaching merit have been all too few and too limited in scope to be conclusive. The problem is very large and the difficulties in the way of getting exact data are many.

It is easier to point out the needs in this field of investigation than it is to meet them. Some of the fundamental needs for the final solution of the problem are the following:

1. A list of terms in which the various aspects of teaching efficiency shall be expressed, terms which are specific in their meaning and which shall be generally recognized as the categories in which teaching efficiency is best described.

2. These terms must be made exact by careful definition and standardization, so that all who use them intelligently will mean the same thing by them.

3. There must be generous co-operation on the part of a large number of school men who are sufficiently trained to know what teaching must

[1] "Causes of Failure among Elementary School Teachers," *School and Home Education*, March, 1914.

be to conform to the best educational principles and who are able to give exact data.

4. We must have command of situations in which two or more officials may test, on the same body of teachers, whatever method is proposed.

Only under conditions such as these will teaching efficiency be resolved into its elements, the relative value of the various factors be determined, and the problem of measuring the presence or absence of qualities of merit be solved.

CHAPTER III

A METHOD FOR GUIDING AND CONTROLLING THE RATING OF TEACHERS

Objective measurement of educational products and processes has not yet reached the point where we can rely upon such measurements to give us all or even most of the information we need about our teachers. We are still dependent, to a very great extent, on the judgment of supervisors and others whose business it is to have this information. This does not mean that we are to be without exactness in our judgment of teaching efficiency, or that we have to belong to the ranks of those who judge by "general impression." Although the exactness cannot be so great as that of objective measurement, the latter will have its place and there will be, further, the accuracy which comes from thorough analysis, careful observation, exact definition of terms, complete record, and controlled conditions at all possible points. The object of any scheme set up for "measuring" teaching efficiency should be to remove the final result as far as possible from arbitrary personal opinion by controlling the method by which the result is obtained.

A large task confronting us in our study of the problem has been the development of some scheme for getting the necessary information in regard to the general efficiency of teachers and the presence or absence of certain supposed qualities in the same teachers; in other words, the development of a rating scheme which should avoid as far as possible the difficulties enumerated in our discussion of rating schemes.

The main considerations in the construction of a rating scheme are (1) selection of factors on which a teacher is best judged, (2) careful definition of terms, and (3) the best method of scoring the judgments.

Choice of terms for judging teaching efficiency.—In choosing the qualities of merit which should form the basis of our analysis of the teacher's efficiency, the following points were held in mind:

1. The topics must not be too few, for either they will be so general that little analysis is made, or, if not general, they will be sure to leave out important points.

2. On the other hand, the list must not be so long as to be cumbersome and a great burden to those who are called on to rate teachers.

3. The qualities must be of the greatest possible suggestiveness, both to supervisors and to teachers. The scheme must direct the attention of the supervisor to the really vital factors of the situation so that he cannot be deceived by any display of nonessentials. The attention of the supervisor should be directed also to the pupils and not alone to the teacher.

4. The terms should set up for the teacher a standard by which to measure her own work, and give her ideas for self-improvement. By helping her to be properly self-critical, they should prepare the way for supervisory criticism and make her willing to receive helpful suggestions. The list should help the teacher also by giving her definite ideas as to what is expected of her by the supervisory staff.

The list of qualities chosen for this study and displayed in the score card reproduced herewith (see Fig. 1, p. 44) does not pretend to be a perfect list, either in statement or in completeness; it has no doubt left out factors which others would include and included some which others would leave out. It has been reduced somewhat arbitrarily from a much longer list gathered from many sources. It has avoided as far as possible vague, general, and all-inclusive terms, such as "personality" and "scholarship." The terms are as specific and exclusive as they could be made. They are not more numerous than seemed to be necessary to include points on all aspects of the teacher's life and work.

The items have been organized under five heads which tend to make the terms more meaningful. The first group, "Personal Equipment," includes certain of the teacher's physical, mental, and moral qualities, personal qualities which might be factors of success in many callings but which are here to be considered in their relation to school activities. Group II, "Social and Professional Equipment," is meant to cover qualities particularly important in the social situation involved in the school, both as related to the children and community and as related to the profession. "School Management" has to do with the mechanical and routine factors of the teacher's schoolroom work, as indicated by her care of the room, handling of classes, and the like. The fact that *Discipline* is placed under this head does not mean that discipline is considered to be a purely mechanical process. A place might have been made for it in Group IV and Group V but it seemed to belong most logically to the management phase of the teacher's work.

Efficiency Record

Teacher Miss E. (Name and) City XXV (or building) Grade taught III (or subject)

Experience 8 years. Salary $57.50 per month.

Highest academic training College graduate

Extent of professional training Pedagogical courses in college: for H. S. teaching.

DETAILED RATING		V. P.	Poor		Medium			Good		Ex.
I. Personal Equipment—	1. General appearance							X		
	2 Health				X					
	3. Voice					X				
	4. Intellectual capacity							X		
	5. Initiative and self-reliance			X						
	6. Adaptability and resourcefulness			X						
	7. Accuracy									X
	8. Industry								X	
	9. Enthusiasm and optimism				X					
	10. Integrity and sincerity								X	
	11. Self-control				X					
	12. Promptness							X		
	13. Tact				X					
	14. Sense of justice							X		
II. Social and Professional Equipment—	15. Academic preparation							X		
	16. Professional preparation				X					
	17. Grasp of subject-matter				X					
	18. Understanding of children			X						
	19. Interest in the life of the school					X				
	20. " " " " " " community				X					
	21. Ability to meet and interest patrons				X					
	22. Interest in lives of pupils					X				
	23. Co-operation and loyalty							X		
	24. Professional interest and growth						X			
	25. Daily preparation						X			
	26. Use of English								X	
III. School Management—	27. Care of light, heat, and ventilation					X				
	28. Neatness of room							X		
	29. Care of routine	X								
	30. Discipline (governing skill)	X								
	31. Definiteness and clearness of aim			X						
	32. Skill in habit formation		X							
	33. Skill in stimulating thought				X					
	34. Skill in teaching how to study			X						
IV. Technique of Teaching—	35. Skill in questioning				X					
	36. Choice of subject-matter		X							
	37. Organization of subject-matter		X							
	38. Skill and care in assignment		X							
	39. Skill in motivating work			X						
	40. Attention to individual needs					X				
	41. Attention and response of the class	X								
	42. Growth of pupils in subject-matter		X							
V. Results—	43. General development of pupils				X					
	44. Stimulation of community			X						
	45. Moral influence				X					
GENERAL RATING			X							

Recorded by —— Position Supt. Date 1/15/15.

FIG. 1.—Individual record showing application of proposed method of rating teachers.

EXPLANATION OF TERMS USED IN SCORE CARD SHOWN ON OPPOSITE PAGE

I. *Personal Equipment* includes physical, mental, and moral qualities.
1. *General appearance*—physique, carriage, dress, and personal neatness.
3. *Voice*—pitch, quality, clearness of schoolroom voice.
4. *Intellectual capacity*—native mental ability.
5. *Initiative and self-reliance*—independence in originating and carrying out ideas.
7. *Accuracy*—in statements, records, reports, and school work.
10. *Integrity and sincerity*—soundness of moral principles and genuineness of character.
13. *Tact*—adroitness, address, quick appreciation of the proper thing to do or say.
14. *Sense of justice*—fairmindedness, ability to give all a "square deal."

II. *Social and Professional Equipment* includes qualities making the teacher better able to deal with social situations and particularly the school situation.
15. *Academic preparation*—school work other than professional. Adequacy for present work.
16. *Professional preparation*—specific training for teaching. Adequacy for present work.
17. *Grasp of subject-matter*—command of the information to be taught or the skill to be developed.
18. *Understanding of children*—insight into child nature; sympathetic, scientific, and practical.
22. *Interest in lives of pupils*—desire to know and help pupils personally, outside of school subjects.
23. *Co-operation and loyalty*—attitude toward colleagues and superior officers.
24. *Professional interest and growth*—effort to keep up to date and improve.
26. *Use of English*—vocabulary, grammar, ease of expression.

III. *School Management* includes mechanical and routine factors.
29. *Care of routine*—saving time and energy by reducing frequently recurring details to mechanical organization.
30. *Discipline* (*governing skill*)—character of order maintained and skill shown in maintaining it.

IV. *Technique of Teaching* includes skill in actual teaching and in the conduct of the recitation.
31. *Definiteness and clearness of aim*—of each lesson and of the work as a whole.
32. *Skill in habit formation*—skill in establishing specific, automatic responses quickly and permanently; drill.
33. *Skill in stimulating thought*—giving opportunity for and direction in reflective thinking.
34. *Skill in teaching how to study*—establishing economical and efficient habits of study.
35. *Skill in questioning*—character and distribution of questions; replies elicited.
36. *Choice of subject-matter*—skill with which the teacher selects the material of instruction to suit the interests, abilities, and needs of the class.
37. *Organization of subject-matter*—the lesson plan and the system in which the subject-matter is presented.
39. *Skill in motivating work*—arousing interest and giving pupils proper incentives for work.
40. *Attention to individual needs*—teacher's care for individual differences, peculiarities, and difficulties.

V. *Results* include evidence of the success of the above conditions and skill.
41. *Attention and response of the class*—extent to which all of the class are interested in the essential part of the lesson and respond to the demands made on them.
42. *Growth of pupils in subject-matter*—shown by pupils' ability to do work of advanced class and to meet more successfully whatever tests are made of their school work.
43. *General development of pupils*—increase in pupils' ability and power along lines other than those of subject-matter.
44. *Stimulation of community*—effect on life of the community tending to improve or stimulate its various activities.
45. *Moral influence*—extent to which the teacher raises the moral tone of the pupils or of the school.

"Technique of Teaching" is a group of factors ordinarily lumped together in the term "instructional skill." A consideration of principles of method reveals the fact that instructional skill is not a simple thing but is an inclusive name for many kinds of skill. A teacher may be strong in some kinds of teaching and weak in others. Moreover, this is the point where teachers are likely to be helped most by an analysis of their activities. Our analysis attempts to bring out some of these phases of teaching technique.

The first four groups of qualities consider the native ability, preparation, social qualities, and technical skill which the teacher puts into the work. The fifth, "Results," considers the effect of these things on the lives and development of the pupils. Some of the items here are more general than we should like. If a teacher is teaching several subjects it is likely that the pupils are making more progress in some subjects than in others. A superintendent wanting to get at the facts more accurately might break up the topic "Growth of pupils in subject-matter" into growth in specific kinds of subject-matter. "General development of pupils" expresses inadequately an important item in the teacher's results. Besides growing in knowledge of subject-matter and in skill in school arts, pupils are changing for better or worse in many other ways, such as ability to work independently, ability to deal with social situations, ability to study, personal habits, and the like. All of these are combined loosely in our term "General development of pupils."

Definition of terms.—It is of the greatest importance that the terms used be understood by all who use them. The rating is practically useless if the one rated, the one reporting, and the one afterward using the report have different things in mind as the meaning of the various qualities. Moreover, one to whom a term suggested much would be more critical of the teacher's standing in that respect than one to whom it suggested little. In order that all might, as far as possible, have the same full meaning, a page of "Explanation of Terms" has been placed opposite the "Efficiency Record," for easy reference. Those terms which did not seem to carry their own meaning completely have been defined or elaborated here. These explanations have been made as brief as is consistent with clearness, in order that reference from equality to explanation might be as easy as possible. Not all the terms have been defined, for in some cases the terms appear to carry their own meaning with sufficient completeness. It would be possible, and per-

haps desirable, to have a greater amount of suggestive material under this head.

Recording the judgment.—The method of recording the rating officer's judgment will have much to do with the effectiveness of the scheme. The mere clerical labor of making a large number of reports is enormous and should be reduced to a minimum. The scheme should make the recording of the judgment as easy as possible by eliminating all unnecessary details of writing and expression.

The record should be of such a character that degrees of excellence can be easily expressed. This should be so clear that comparisons of different qualities in the same teacher and of the same quality in different teachers can be made without difficulty.

The terms in which the degrees of excellence are expressed should be reducible to a single term to indicate a "success grade" for the teacher, if desired.

The record should permit quick and easy analysis so that the teacher's weak and strong points would appear at once.

For these reasons, the method of recording the judgment should be as objective and "visible" as possible. The judgment must be made to stand out clear-cut, comparable, and as meaningful as may be.

We have seen in an earlier part of our study the difficulties involved in the methods of record commonly used. These methods do not seem at all capable of meeting the demands we have just set down.

The form of expression which is most likely to suit our needs and express adequately such a complex fact as a teacher's efficiency is that of graphical representation. It is possible to express easily, by means of a curve, many things that could be expressed in words with the greatest difficulty. The value of the graphical method will be apparent as we proceed.

A graphical method of recording judgments.—As will be seen from the score card reproduced on p. 44, there is opposite each quality a scale on which the degree of excellence is expressed by the distance measured along the line from the base.

In order to facilitate the placing of a teacher along this line and—what is equally important—to control the placement to some extent, it seemed wise to make a fivefold division of our scale. These five divisions are called, beginning at the left, Very Poor, Poor, Medium, Good, and Excellent. Contrary to the practice of most rating schemes which rate

teachers on a fourfold scale, we used five divisions in order that there might be a Medium and the possibility of differentiation into those Good and Excellent in the group above medium, and into Poor and Very Poor in the group below medium. It should be easy to place a teacher in one of these five classes with respect to any quality, whereas the placement in a scale of many divisions, without such control, might be confusing and uncertain.

The size of the divisions is suggested by the curve of probability. If we had a very large number of teachers classified with respect to any one quality, we should expect to find the largest number medium, not so many good or poor, and still fewer excellent or very poor. The exact number falling in each division would depend on our arrangement of the limits. Various investigators have proposed different percentages for these divisions. We give here the number out of 100 recommended by Professors Meyer,[1] Dearborn,[2] and Cattell,[3] as proper for each division of Very Poor, Poor, Medium, Good, Excellent.

	Very Poor	Poor	Medium	Good	Excellent
Meyer	3	22	50	22	3
Dearborn	2	23	50	23	2
Cattell	10	20	40	20	10

We have chosen the more liberal and more easily applied division of Cattell for our division of the scale. We have divided the line into ten equal spaces arranged in five groups of 1, 2, 4, 2, and 1 spaces each.

A supervisor's first judgment, then, with respect to a teacher's standing in any of the qualities indicated, must be to determine the class in which she should be rated for that quality.

Within the class there is further opportunity for differentiation. Thus, if a teacher is Good in any quality but nearly Excellent, the mark for that quality will go in the space near the Excellent division; if the teacher is barely Good in the quality considered, the mark will be placed in the space next to Medium.

[1] M. Meyer, "The Grading of Students," *Science*, N.S., XXVIII, 243.

[2] W. F. Dearborn, "School and University Grades," *Bull. of Univ. of Wis. No. 36*, 1910.

[3] J. McK. Cattell, "Examinations, Grades and Credits," *Pop. Sci. Mo.*, LXVI, 367.

The instructions accompanying each efficiency record are as follows:

INSTRUCTIONS

1. Before filling out the record, read the "Explanation of Terms" on p. 3.

2. Opposite General Rating and opposite each quality of merit is a scale on which may be indicated all shades of judgment from Very Poor to Excellent. Place a small cross (×) in that space which indicates your judgment in each case.

EXAMPLE

Qualities of Merit	V.P.	Poor		Medium				Good		Ex.
General appearance...							×			
Health.....		×								
Voice.....					×					

The crosses indicate that in general appearance the teacher is judged to be Medium but nearly Good; in health Poor bordering on Very Poor; in voice Medium.

3. *General Rating* is your estimate of the general merit of the teacher based on your knowledge of her work. It is to be recorded *after* making the detailed rating. Very Poor general rating means that the teacher is practically a failure and not worthy of retention. Poor general rating means that the teacher is unsatisfactory and below the average for that place but still usable. Medium means average merit for the position held. Good means above the average. Excellent means very superior.

4. *Detailed Rating:* Each quality is to be judged on its own basis without reference to other qualities. Your mark will express your judgment as to the degree of presence or absence of merit in the teacher with reference to the quality in question. A mark of Very Poor in any quality means extreme lack of merit as far as that quality is concerned. Poor means unsatisfactory and below the average. Medium means satisfactory or average merit in the quality. Good is above the average. Excellent is very superior.

5. Each judgment should be the result of careful thought based on actual observations. If doubt is felt as to the correctness of any judgment, record it with a question mark (?) instead of with the cross (×). If you can express no opinion as to any quality, make a note of the reason. This is important.

6. Note the questions on p. 4.

The questions referred to were designed to bring out the effect of the blank on the judgment of the one using it, and also any criticisms that he might have in mind.

Application of the blank to an individual case.—How the scheme just described operates is best shown by referring to an actual record such as that reproduced on p. 44, Fig. 1. This report displays the superintendent's analysis of this teacher and shows very clearly the components of her efficiency, in his estimation. Miss E's General Rating is given as Poor and an examination of her Detailed Rating confirms this judgment. In most particulars she is quite satisfactory and even above the average. Her academic preparation is very good but her professional training is limited and not adapted to the third grade. She is still inexperienced and has therefore not had her understanding of children and her technique developed. This fact and her lack of routine probably account for her very poor discipline and inattentive class. We must be careful not to infer too much, but these relations seem clear. On the basis of the personal, social, and professional equipment alone, it would be possible to write for this teacher an excellent recommendation, but when all the facts are scrutinized, one's opinion of her teaching efficiency is very much lowered. She must be set down as a poor teacher but one who has possibilities of being a good teacher.

Reduction of the rating to a single term.—The General Rating is the rating officer's own judgment of the teacher's general merit recorded *after* filling out the Detailed Rating. It is not determined mathematically but is the officer's mental summation of the qualities on which he has just passed judgment. As the record stands, it indicates nothing as to the relative value of the various qualities. It simply allows for judgment on each quality and indicates general merit by the location of the resulting "curve." We may resort to other means, however, to get the general result.

The Median: Taking our individual case again (Fig. 1), it will be noticed that 3 qualities fall in column 1, 5 in column 2, 7 in column 3, and so on until the 45 qualities are placed. The Median or middle point of this distribution falls in column 5 and is 5.03, 30 per cent higher up the scale than the superintendent's judgment.

The Average: If we multiply the number of each column by the number of qualities falling in it and divide the sum of these products by 45, we have the average of the distribution. In this case it turns out to be 5.02.

It will be seen at once that these two methods of determining the general merit grade are based on the assumption that all the qualities

are of equal value, which, of course, they are not. It is obvious that some of these qualities should have more consideration than others in determining the teacher's general merit.

These methods are most liable to error when the qualities are scattered as in the case of our illustration. In such a case some points are rated so low that the teacher is obviously poor, yet so many qualities are rated high that the Average and Median of their distribution are raised to a point which would make the teacher seem to be quite satisfactory. There would be little or no error if the qualities all fell into one column or were distributed to only two or three columns close together; that is, supposing our list of qualities is itself satisfactory as a basis for judging teaching efficiency.

It is necessary that the qualities be weighted in proportion to their importance if a mathematically determined success grade is to be true. The relative importance of the qualities of merit here considered is a point on which we hope to have some light as a result of the information gathered by this method of rating.

Before taking up this important point, let us see what the nature of our information is, how reliable it is, and how well our proposed method really guides and controls the rating of teachers.

CHAPTER IV

TESTS OF THE PROPOSED METHOD

Any conclusions to which we may come later in regard to the relative importance of the various qualities of merit and in regard to other problems involved are based on the experience and work of between 40 and 50 school men and women who have tried out and criticized for us the scheme just described. In the correlations to be discussed later, ratings of 424 teachers from 39 schools were used. These 39 schools were representative of 27 cities, all but 8 of which are in Illinois. They represent populations varying in size from less than four thousand to two million. The smallest number of ratings used coming from one source was 5, the largest number was 25. Most of the officials co-operating with us contributed about 10 ratings each. Their work was quite voluntary and very generously given because of their interest in the problem. The only cases in which the ratings may not have been voluntary were those of principals in one city who were asked by their superintendent to rate their teachers for us. Twenty of the rating officers were superintendents and 19 of them principals. Ten of the latter were women.

Ratings of whole schools by single judges.—Typical results obtained when a body of teachers is rated by one officer are shown in Figs. 2 and 3. Each figure displays the ratings of the Best teacher in the given group, the Poorest of the group, and the Median made up of the middle points of the whole number of ratings for each quality. Thus in Fig. 2 the best teacher, Miss S., is marked Poor in General Appearance, while the poorest, Miss M., is rated a low Medium. The Median of the 19 teachers with respect to General Appearance is Good, which means that there are at least as many teachers rated Good or Excellent in General Appearance as there are teachers rated below. The teacher called Best is called so because she received the highest General Rating, or, if more than one received the same high General Rating, because she had the highest Median Rating (see chap. iii). Similarly, the one called Poorest was rated lowest. The Best and the Poorest in each case are the upper and lower limits as far as general merit is concerned but their ratings in detail are not always the extremes. Thus in Fig. 2 both are below

Median in General Appearance (quality 1), both are above Median in Professional Interest and Growth (24), and Best ranks below Poorest in Professional Preparation (16). The Median curve represents the central tendency of the group as a whole.

Both of these sets of curves show clearly that, as we naturally expect, Good and Poor teachers are more distinguishable in some qualities than in others. In some cases the Good and Poor curves are quite divergent from each other and from the Median. In others there is much confusion. Fig. 2 shows more clearly than does Fig. 3 the fact that the Good and Poor curves diverge more in those qualities from Discipline down than in the personal and social qualities in the upper part of the schedule. This is quite generally the case. The qualities in these upper sections which usually show divergence are Initiative (5), Adaptability (6), Grasp of Subject-Matter (17), and Understanding of Children (18).

There is shown a tendency toward greater liberality of judgment in the first two groups of qualities than in the last two. The Median or group curves tend to the right in the upper part of the score card. This is especially noticeable in young teachers, as in the case of our example in Fig. 1 (chap. iii). Young teachers may be quite well equipped personally and socially, but only experience, practice, and training can develop their understanding of children and their technical skill. It is also possible for older teachers to be held in high esteem for their personal qualities and yet be marked low for other and more technical reasons.

Ratings by judges at different times.—It is important to know whether these results are accidental or whether a rating officer would get the same record a second time, without referring to the first result. A number of our correspondents have been willing to rate their teachers for us a second time and the results in two cases are given in Fig. 4. Principals of Schools IV*c* and IV*e* rated their teachers in May and again in the following December. The curves in Fig. 4 are, as indicated, the records of the Best and Poorest teachers in these two schools at these two times. The principals did not have the first records at hand for reference.

In School IV*e* the two ratings of the Best teacher are identical with the exception of one item, Health, which is lowered one point. The second rating of the Poorest teacher follows the first very closely in spite of its scattered character. The December rating raises the detailed rating in 26 points, is identical with that of May in 11 points, and lowers

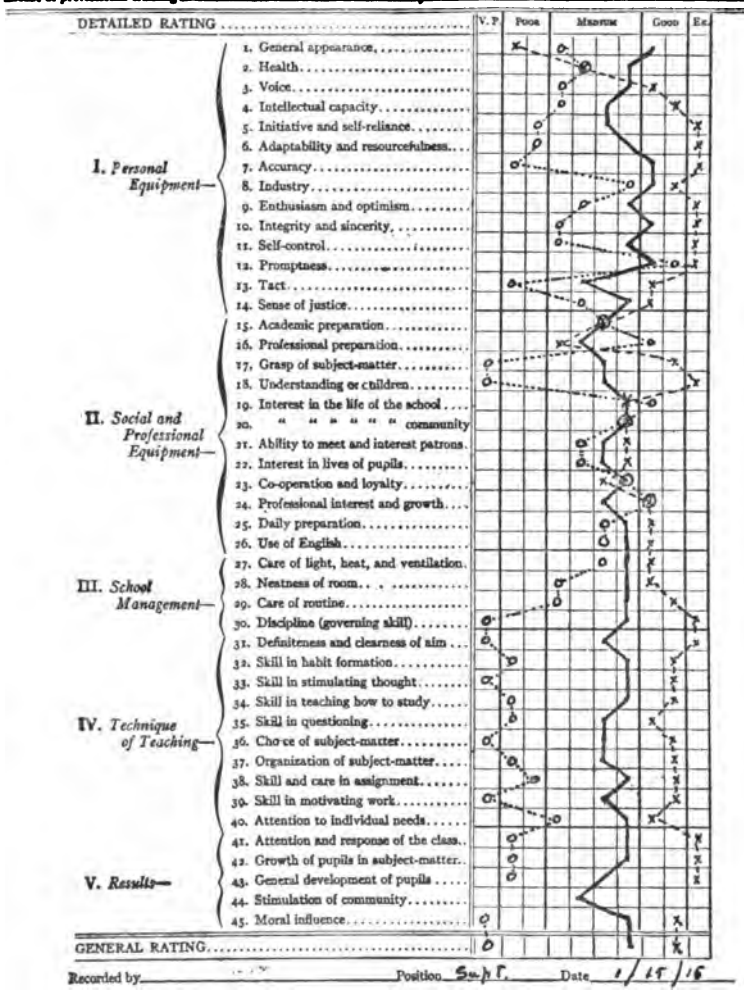
Efficiency Record

Teacher Regd-Miss S. ; Asses't-Miss M. (indicate sex) City XXV (or building) Grade taught B. 4th ; P. 1st (or subject)

Experience B-10yr ; P. 6 years. Salary B-70 ; P 67.50 per month.

Highest academic training B- High School ; P. High School

Extent of professional training B- 2 Summer Terms ; P. Normal Graduate.

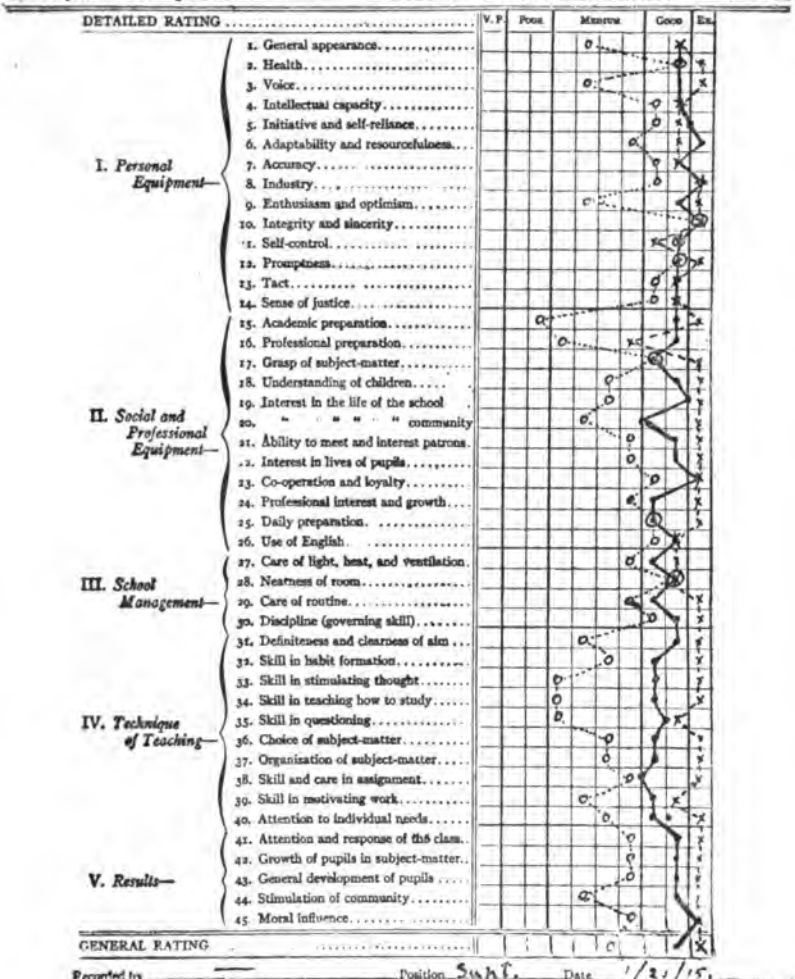


Recorded by _____ Position Supt. Date 1/15/16

FIG. 2.—Summary of records from School XXV

Efficiency Record

Teacher B.&P.- Miss J. ; P.&P.T.-Miss C. City XXVI (or building) Grade taught B.- 7th ; P.- (or subject)
(Indicate use)
Experience B.- 2 ; P.- 12 years. Salary B.- $65 ; P.- $75 per month.
Highest academic training B.- High School + College ; P.- High School.
Extent of professional training B.- ; P.- Summer courses.



Recorded by ——— Position Supt. Date 1/21/15

FIG. 3.—Summary of records from School XXVI

it in 8. Notwithstanding the general upward tendency of the second record, the second General Rating is one point lower than the first. This is probably due to the fact that the first General Rating is too high to be consistent with the details. The changes downward, in items 4, 15, and 16, are obviously due to change in the principal's judgment, as these qualities could not have changed as they are recorded to have changed.

The records from School IV*c* show considerable downward revision in the case of the Best teacher and upward revision in the case of the Poorest. There is no change in the General Ratings. Here, as in School IV*e*, we find a downward change of the estimate on Academic and Professional Preparation, a change which could not be made. Discrepancies like this, and other changes which are not due to actual differences in the teacher judged, can no doubt be very largely overcome by practice and by greater clearness in the mind of the judge as to what he means by the various grades of excellence in these particulars.

Ratings of teachers by two or more judges.—The most important test of any rating device is its ability to bring the same result when a teacher is rated by two or more judges. It is very improbable that two judges of a teacher would see and record merit or lack of it in exactly the same way. Variation is to be expected in this as in the use of every other measuring device, but we should know how much variation to expect and how much it may be reduced by practice. To obtain control of situations giving us ratings of a teacher by more than one judge has been nearly impossible. Our scheme has therefore not been tested as severely in this way as is desirable.

This phase of our problem can best be solved by city superintendents with corps of supervisors and long periods of time at their command.

The superintendent of School XL secured for us the co-operation of some of his supervisors in rating a number of his teachers. The records of two of these teachers as given by three judges each are shown in the accompanying Fig. 5. Teacher A was rated by the superintendent, the supervisor of elementary grades, and a general supply teacher. Teacher B was rated by the superintendent, the supervisor, and her principal.

An examination of Fig. 5 will show very great agreement among the three judges in these cases. At one point (28) in A, there is a divergence of four spaces, but very few differences are more than two spaces. In the cases of two other teachers not shown here, the supervisor gave ratings of Good, while a general supply teacher in one case

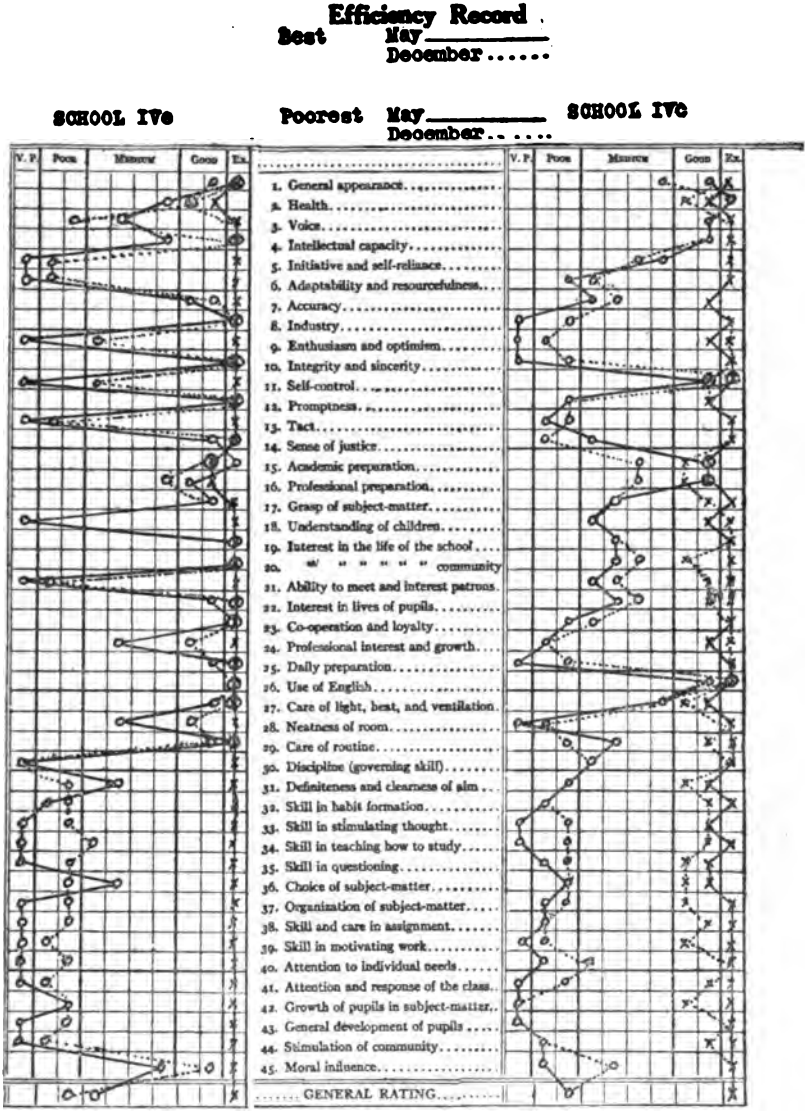


FIG. 4.—Ratings made at different times

Efficiency Record

Superintendent_____
Supervisor.....
Third Judge_____

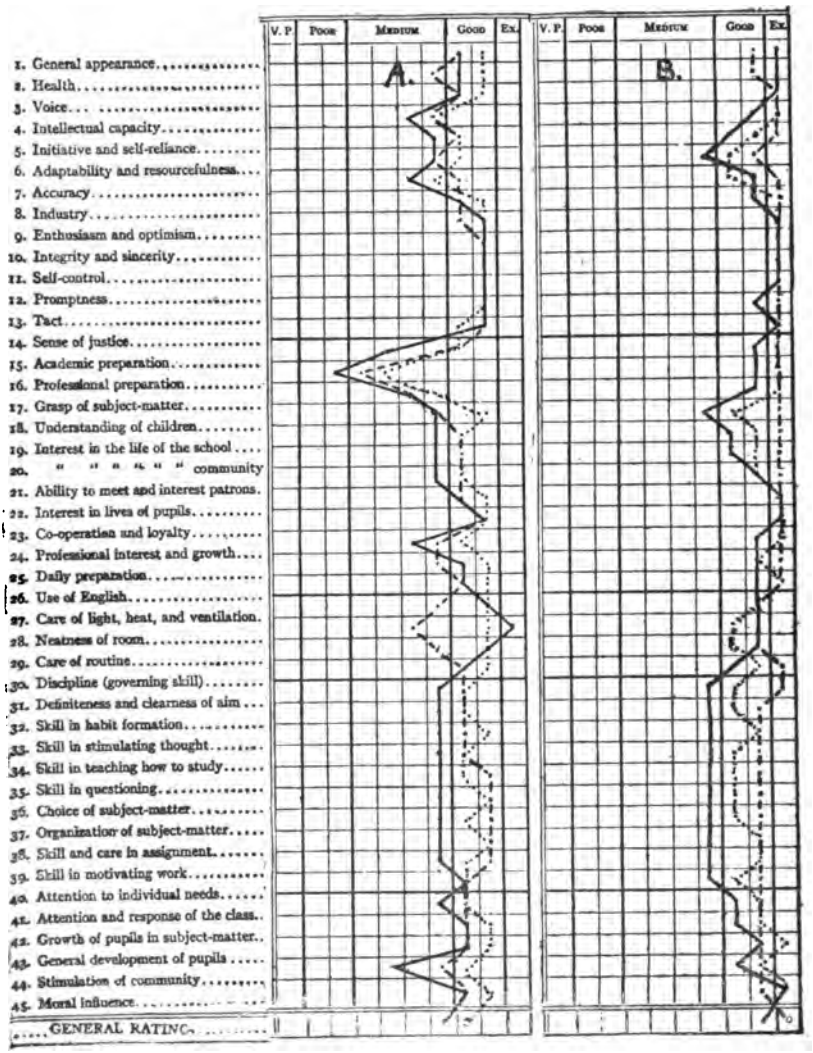


FIG. 5.—Ratings of two teachers A and B by third judge

and a principal in the other gave ratings of Medium, a difference of three spaces in General Rating, and larger differences in many details. Through another means we were able to obtain incomplete ratings of a teacher from officers in three different towns where she had taught. These ratings are liable to error owing to lapse of time, but, notwithstanding that, they agree within one space as to General Rating, placing her at high Medium or Good, and within five spaces in detail. Judgments are likely to differ from one class of excellence to another adjoining, such as from Medium to Good or Medium to Poor, or from Good to Excellent, but seldom from Good to Poor or farther.

Differing standards of excellence.—One of the largest complicating factors preventing exact and comparable results is the difference of standards of excellence in the minds of the judges. A teacher who ranks Excellent in one officer's mind is found to rank only Good or perhaps Medium in the rating of another judge who is more critical and less easily satisfied. We find numerous examples of this difference in standards in the ratings at hand. In Fig. 5, just reviewed, the superintendent is more critical of A and B than are the other two rating officers. In Fig. 6 we have the same thing shown in a larger way. Fig. 6 compares the best, poorest, and median (or group) records from two schools in the same city. It is not likely that in this city of 24,000 there is any great difference in the ability of the teaching body from school to school. We are assured by the superintendent that there is no reason to think that the teaching force of one school is much better or worse than that of another. Any striking differences found are in all probability due to difference in standards of excellence held by the principals. The principal of School XXI*a* rates her eight teachers high, one being Excellent, six Good, and one a high Medium. As a group her teachers are very good. The principal of School XXI*c* has rated his thirteen teachers much lower, one being Excellent, one Good, ten Medium, and one Poor. The group curve falls in the Medium column 40 to 50 per cent lower than Principal XXI*a*. It is obvious that Principal XXI*c* is much more critical than Principal XXI*a*. The reason for this is perhaps explained by the training and experience they bring to this work of judging teachers. Principal XXI*c* is a man with six years of experience besides being a normal graduate and having a year of university study along professional lines. Principal XXI*a* is a woman with an experience of twenty-nine years and little or no professional training.

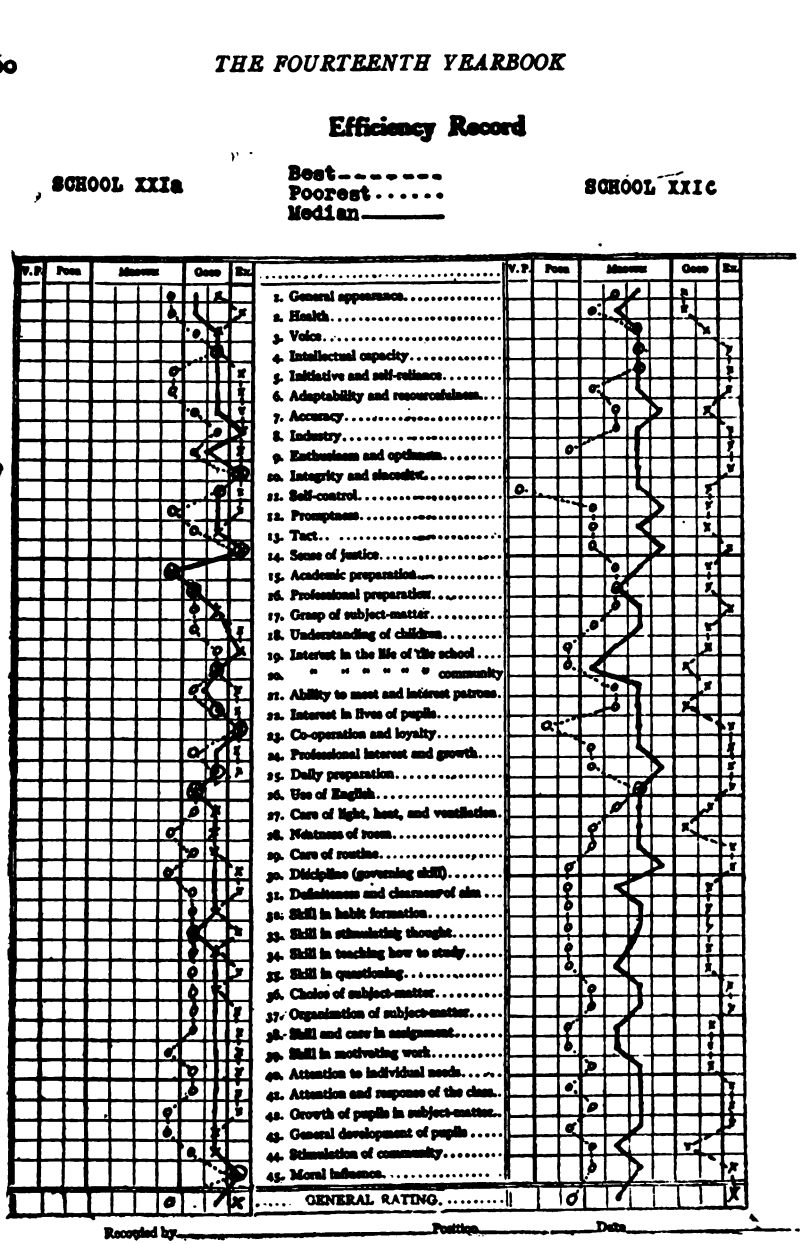


FIG. 6.—Summary ratings from Schools XXI*a* and XXI*c*

Differing abilities to discriminate.—These curves of Fig. 6 illustrate equally well another difficulty in the way of obtaining comparable data, namely, the unequal abilities of school officers to discriminate between teachers as to their merit in the various items of our schedule. If the ratings for School XXI*a* are true in all respects, that body of teachers is remarkably good and remarkably uniform. It is probable, however, that the records of School XXI*c* are nearer the truth.

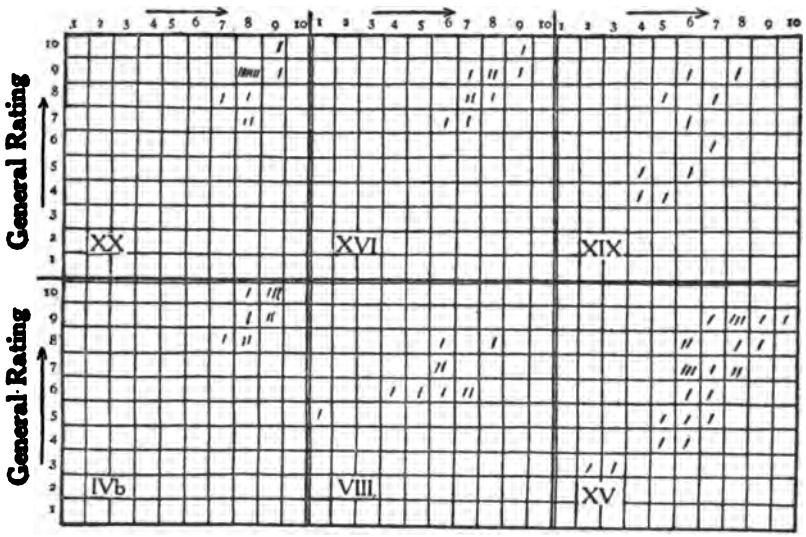


TABLE IX.—Combined General Ratings and ratings in Skill in Questioning showing differing amounts of discrimination in six schools. (General Ratings run from bottom to top in each square. Ratings in the quality run from left to right.)

Difference in discrimination is shown not only in regard to general merit but in regard to each quality. As we shall point out later, more discrimination is to be expected in some qualities than in others, but in any one quality there is wide variation in ability to see differences.

This is shown graphically in Table IX, where the ratings for Skill in Questioning and the General Ratings are combined in the cases of six different schools. In School IV*b*, the ten teachers are Good in Skill in Questioning. The thirteen teachers of School XX range from Excellent to Medium in general merit, but are confined to Good except in one

case. School XV shows wide variation both in general and in the particular quality. The superintendent in School VIII gives his teachers General Ratings of Good or Medium but ratings in Questioning Ability ranging from Good to Very Poor.

The chief conclusion to be drawn from this discussion of differing standards and unequal abilities to discriminate is that, if the ratings in any city are to be uniform from school to school and used as a common basis for comparison, the officers making the ratings must be trained to a common standard of excellence and brought to a common basis of discrimination. As rating of this kind is now done it is as much an indication of the ability of the rating officer as it is a measure of the ability of the teacher. Greater mutual understanding, and more information and practice will do much to reduce the discrepancies found in these records and make them more truly measures of teaching efficiency.

How the blank controls the rating.—Many rating schemes have failed and have been discarded because after a few years all grades were raised to the point where no discrimination was shown. The rating scheme must control this factor and prevent the raising of the success grade from year to year unless real improvement is shown. In the scheme here proposed, the rating officer is required to pass judgment on separate items, one by one, and rate them as Very Poor, Poor, Medium, Good, or Excellent. The judge cannot very well give a high general grade for poor ability, for either he must misrepresent the teacher all along the line, or have his General Rating inconsistent with the details.

The extent to which the principals and superintendents who have tried this blank have been influenced and controlled by it in their final rating is best shown by their answers to our question: "Did filling out this record modify your previous opinion of this teacher? If so, how?"

When the officers were in the habit of rating their teachers the blank did not change their general opinion to any extent. They say, however, that filling out the record particularized their judgment. The cases in which judgments were lowered and those in which new points of excellence were found, are about equal. Some of the answers to our question are as follows:

"Careful thought necessitated, showed up faults."

"Lowered opinion."

"Made factors of judgment more definite and certain."

"Strengthened opinion; led to closer analysis."
"Lowered opinion three points."
"Raised rating."
"Made rating more definite."
"Gained more definite detailed knowledge."
"Made me realize her possibilities."
"Discovered good points."
"Points of excellence not realized before."
"Rated him higher than before."
"Detailed attention to III, IV, and V depreciated opinion of her."
"Previously gave too much attention to minor points."
"General impression was more favorable than analysis justified."

These quotations and others which we might give indicate plainly the unreliability of general impressions and unanalyzed judgments. The judgment may be raised or lowered by a closer study of the teacher, but in either case the previous judgment was not correct and would have been an injustice to teacher and school.

Difficulties in filling out the record.—As our blank was first constructed, it had twenty spaces in the scale instead of ten. The number was reduced because of the difficulty rating officers felt in choosing among so many. There were more choices possible than they could distinguish. Definition of Excellent, Good, Medium, Poor, and Very Poor in General Rating and Detailed Rating has also helped eliminate doubt from the minds of the judges as to where on the scale the teacher should be placed. Our definitions of these terms have, of necessity, been of a most general character. Detailed definition of what is Excellent, Good, Medium, Poor, and Very Poor, General Appearance, or Skill in Questioning, or Growth of Pupils in Subject-Matter, or other particular qualities would be very difficult and tedious in any circumstances and quite impossible within the limits of a score card.

There was difficulty in applying all the terms to all situations. For instance Stimulation of Community is hard to apply in the city where teachers may scarcely touch the community outside the school. In a small town this item would be more important.

More frequent is the difficulty of applying all items to all grades in the same school. Thus principals sometimes hesitate to grade primary teachers on Teaching How to Study and on Assignment when little or no formal study is done. Likewise teachers of manual arts have little to do with study and assignments as ordinarily understood.

A much greater source of difficulty has already been mentioned in our discussion of differing abilities of the judges to discriminate between teachers. This lack of discrimination is due in largest measure to actual ignorance on the part of the rating officer, first as to what constitutes excellence in many of the aspects of teaching, and second, as to what the teachers are actually doing. In response to our request to note any difficulties in filling out the record, Technique of Teaching is set down most often as the set of qualities most difficult to judge. There is little hesitancy or uncertainty in expressing opinion about the teacher's personal or social qualities.

Some of the principals excuse themselves on the ground that they do not have sufficient time for observation, and this may very well be true in the cases of those who do regular teaching work.

Objection has been raised to the large number of points to be considered. On the other hand, additional points have been urged. It is probable that the list here tested is as long as it ought to be if the convenience and limited time of judges are considered. At the same time it would be difficult to reduce the list if it is to be a basis for self-criticism on the part of the teacher and a method of helping her in detail. As was said in another connection, if the General Rating were the only purpose accomplished, a shorter list would be sufficient.

The time required to fill out each individual record is variously given as from 5 to 45 minutes. The usual amount of time required is about 15 minutes, after the information has been gathered. After a principal or supervisor has worked with a teacher for some months and has had many opportunities for observing her with regard to the points here enumerated, all of which is in his daily line of duty, it should not be at all difficult for the officer to fill out the record in 10 minutes. This does not seem to be an excessive amount of time to give to this important and delicate work.

SUMMARY

1. The ratings shown in this chapter, and others which we have at hand, show clearly the possibility of expressing by the graphical method all shades of excellence and all combinations of specific kinds of excellence in teachers.

2. With slight variations, principals are able to get the same result at two different times without reference to the first record made.

3. Different judges of the same teacher are able to obtain results varying from each other less than three spaces of the scale.

4. Comparability of ratings from different schools is lessened by differing standards of excellence from school to school and by differing abilities to discriminate on the part of school officers.

5. If results from different schools are to be made thoroughly comparable the judges of teachers must be trained to a common standard of excellence and be given a common fund of knowledge as to what constitutes excellence in teaching.

6. Tests show that the use of an analytical blank of this kind may raise or lower judgments previously formed. General impressions and unanalyzed judgments are not reliable.

CHAPTER V

RELATIVE IMPORTANCE OF QUALITIES OF MERIT

The problem.—The rating device which we have described in the preceding chapter was designed primarily to obtain for us information on which to base an accurate estimate of the value of the qualities of teaching merit there set forth. Our idea has been to make it as easy as possible for school officials to give us correct information. The rating officer is not worried by any schedule of values or what *he thinks* is the relative importance of the qualities under consideration. He has before him in each case an actual teacher whose various qualities he is judging in terms of Excellent, Good, Medium, Poor, and Very Poor, with variations. At the end of this series of judgments he sums up these qualities as they appeal to him in this teacher and records in like manner a grade representing her general merit. When a number of such records are combined we find that he has given us, more or less unconsciously, very good evidence as to what qualities he actually lays emphasis upon when he judges teachers. This evidence is the relation which the ratings in the various qualities bear to the ratings in general merit. The amount of emphasis which he puts on any quality will be measured by the degree of correspondence between the two series of ratings. If we put together a large number of such sets of ratings, they should tell us—in so far as they are true—the extent to which these qualities are related to general teaching merit, and this would furnish a basis by which any judge of teachers might correct the emphasis in his own judgments. The determination of the relation between the qualities of merit and general merits and the relative emphasis to be placed on the various factors is the problem immediately before us.

In determining the correlations given below, the ratings of 424 teachers from 39 schools have been combined. As we saw in one study of these ratings in the last chapter, they represent wide variations of ability both on the part of the judges and on the part of the teachers. They come from schools in towns and cities of various sizes and of different character of population. Our instructions to those rating teachers for us were that if all the teachers were not rated, those selected for rating should represent as wide a range of teaching efficiency as the officer

had in his school. There is, therefore, nothing about the method of selection making it improbable that our sampling of the elementary teaching population represents it fairly accurately. On the other hand, the number of teachers rated is very much too small. There is every reason to believe that the rating officers have done the best they could in differentiating their teachers for us. If they have not succeeded in all cases as well as it seems to us they should, their effort is of value in showing what results may be accomplished under present conditions and gives us a starting-point for future development.

Method of correlation.—In bringing these ratings together and determining the correlations between the ratings in general merit and the ratings in the qualities, the material was taken through the following steps:

1. The ratings for each school were brought together on one sheet in a series of small double frequency tables, samples of which are shown in Tables IX and XVI. Each table shows the distribution of the teachers in that school with respect to General Rating (ranks numbered from bottom to top) and to rating in one of the 45 qualities of merits (ranks numbered from left to right).

2. The small tables for each quality in the 39 individual distributions were then combined into a series of 45 larger double frequency tables, one for each quality. Samples of these are shown in Tables XI–XIII.

3. The calculation of the Pearson coefficient of correlation from these tables was a comparatively simple matter.[1] The correlation formula used was

$$r = \frac{E(x-y)}{\sqrt{Ex^2}\ \sqrt{Ey^2}}.$$

The relation of qualities of merit to general merit.—The correlations resulting from the foregoing processes are given in Table X. The arrangement of the 45 qualities is the same as in the score card. Opposite each factor is its coefficient of correlation with general merit and a number indicating the rank of that correlation in the group. The relative ranking of the qualities is shown graphically in the same table.

It will be noticed at once that the qualities having the highest correlation with general merit are those of the "Technique of Teaching"

[1] For a complete account of this method of correlation see Thorndike, *Mental and Social Measurements*, 2d ed., pp. 172–77.

and "Results" groups. The highest ten qualities are found in this part of our schedule. The qualities least positively related to general merit

	With	r	Rank
I. *Personal Equipment*—	1. General appearance	.47	43
	2. Health	.56	30
	3. Voice	.53	42
	4. Intellectual capacity	.62	34
	5. Initiative and self-reliance	.77	13
	6. Adaptability and resourcefulness	.80	11
	7. Accuracy	.76	17
	8. Industry	.69	24
	9. Enthusiasm and optimism	.72	22
	10. Integrity and sincerity	.63	33
	11. Self-control	.66	30
	12. Promptness	.66	29
	13. Tact	.69	25
	14. Sense of justice	.62	36
II. *Social and Professional Equipment*—	15. Academic preparation	.42	44
	16. Professional preparation	.58	46
	17. Grasp of subject-matter	.72	19
	18. Understanding of children	.76	15
	19. Interest in the life of the school	.65	31
	20. " " " " " " community	.62	35
	21. Ability to meet and interest patrons	.62	38
	22. Interest in lives of pupils	.69	26
	23. Co-operation and loyalty	.66	28
	24. Professional interest and growth	.72	20
	25. Daily preparation	.68	27
	26. Use of English	.55	40
III. *School Management*—	27. Care of light, heat, and ventilation	.62	37
	28. Neatness of room	.56	42
	29. Care of routine	.64	32
	30. Discipline (governing skill)	.70	21
	31. Definiteness and clearness of aim	.82	10
	32. Skill in habit formation	.86	5
	33. Skill in stimulating thought	.84	8
	34. Skill in teaching how to study	.84	7
IV. *Technique of Teaching*—	35. Skill in questioning	.72	20
	36. Choice of subject-matter	.85	6
	37. Organization of subject-matter	.87	3
	38. Skill and care in assignment	.82	9
	39. Skill in motivating work	.74	16
	40. Attention to individual needs	.76	14
	41. Attention and response of the class	.86	4
	42. Growth of pupils in subject-matter	.87	2
V. *Results*—	43. General development of pupils	.88	1
	44. Stimulation of community	.70	23
	45. Moral influence	.72	22

TABLE X.—Correlations of General Rating

are Academic and Professional Preparation, the physical qualities of Appearance, Health, and Voice, Use of English, and Neatness of Room. Only 4 of the 14 personal qualities and 3 of the 12 in the social and

professional group rank as high as the technical qualities. Discipline ranks twelfth, but its correlation of 0.79 is very little below those of the qualities ranking immediately above it. The curve of relationship rises as it moves from the general personal qualities in the first part of the schedule to those having more particular bearing on teaching work.

The correlations examined.—A closer inspection of our data in their immediate relation to these correlations will reveal the reasons for their present ranking. Tables XI, XII, and XIII show the distribution of the teachers in qualities which rank in three different parts of the list. Skill in Teaching How to Study ranking high (7th), Co-operation and Loyalty from the middle of the list (28th), and Health which ranks low (39th). The correlations depend on the degree in which the ratings in the two categories general merit and quality merit tend to be the same. If they were exactly the same, they would be arranged in a diagonal from 10–10 to 1–1 and the correlation would be perfect or 1.00. If those ranking high in one ranked correspondingly low in the other, the ratings would be arranged in a diagonal from 10–1 to 1–10 and the correlation would be negative or −1.00. If they are scattered by chance over the 100 possible combinations, the correlation would be 0. We find all these correlations to be positive, ranging from +0.38 to +0.88. The correlations are higher as the ratings tend to cluster along the diagonal 10–10 to 1–1, and lower as they are scattered from that diagonal.

Skill in Teaching How to Study is one of those qualities in which the ratings in the quality tend to be the same as the General Ratings. Co-operation and Loyalty and Health are more and more scattered. This same difference is shown graphically in Figs. 7, 8, and 9, corresponding to Tables XI, XII, and XIII. In these figures we see the relation between the medians of the two sets of ratings. The solid line in each figure connects the medians of the ratings in the quality which belong to each degree of general excellence. The dotted line connects the medians of the general ratings corresponding to each degree of excellence in the quality. The nearer these two relation lines are together the greater the correlation, and vice versa. If we let these medians stand for the group, we may say from Fig. 7 that the teachers here called excellent have very good Skill in Teaching How to Study, those medium in one are medium in the other, and so on. On the other hand, if we consider Table XI, we find wide variation in individuals. Thus those

SKILL IN TEACHING HOW TO STUDY (r = .84)

General Rating \ Rank	1	2	3	4	5	6	7	8	9	10	No.
10								5	22	23	50
9					1		2	38	27	3	80
8			1	1	6	10	29	29	11	2	89
7				3	8	18	27	9	1		65
6			1	5	12	23	9	3			53
5		1	1	5	13	9	2				31
4		1	5	10	1		2				21
3		2	4	4	2						11
2		2	1								3
1		1									1
No.	1	7	12	23	40	60	77	84	61	25	N 408

TABLE XI

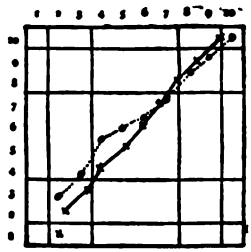


FIG. 7

CO-OPERATION AND LOYALTY (r = .66)

General Rating \ Rank	1	2	3	4	5	6	7	8	9	10	No.
10							3	1	0	43	57
9				3		2	2	4	26	49	86
8	3	2	1		2	11	13	20	22		92
7		3	8	3	2	13	14	16	16		69
6			6	2	8	7	12	9	9		53
5		3	7	5	2	4	0	3	2		32
4	2	5	2	2	3	3	3	1	1		22
3	2		4	2		1	1		1		10
2			3				2				5
1						1					1
No.	7	13	34	17	16	44	50	53	77	92	N 400

TABLE XII

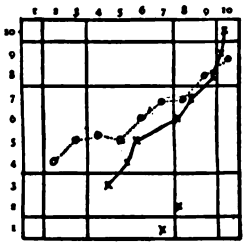


FIG. 8

HEALTH (r = .56)

General Rating \ Rank	1	2	3	4	5	6	7	8	9	10	No.
10		1			1	1	4	11	8	25	51
9				1	4	2	9	8	32	30	85
8	1		2	3	3	15	14	25	19		92
7				4	5	6	16	10	24	7	70
6		2			5	6	6	11	13	9	52
5				2	4	3	7	8	8	1	33
4		1			3	1	5	3	4	4	21
3				2				4	2	2	11
2				1	1			1			3
1					1						1
No.	1	4	2	17	32	34	61	101	110	61	N 423

TABLE XIII

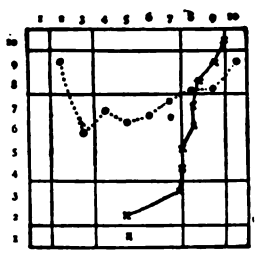


FIG. 9

graded 8 in General Rating range from 3 to 10 in Teaching How to Study.

Co-operation and Loyalty is a combination of virtues upon which much stress is generally laid by rating schemes. The data here presented indicate that, in this group of 420 teachers, while there is considerable correspondence between co-operation and general merit, most of the group are inclined to co-operate and be loyal. This quality varies much less than their general merit. One finds good and poor teachers ranging from poor to excellent in co-operation.

The same is true of Health. Most of the teachers are in good or excellent health, but this does not make them good teachers. Health is a very important asset in teaching, but the possession of it or the lack of it is little indication of teaching ability.

PROFESSIONAL PREPARATION

Rank	1	2	3	4	5	6	7	8	9	10	No.
10			3	1	2	4	7	7	14	16	52
9			3	5	9	8	6	19	22	10	80
8	2	2	6	6	6	10	13	21	10	12	88
7	4	4	5	7	9	13	9	6	7	1	67
6	1		4	15	9	10	5		3	3	50
5	1	1	4	8	8	4	2	3	2		33
4	2	3	1	10	2	1	2	1			22
3			2	2	2	2	2			1	11
2			1	2							3
1								1			1
No.	8	8	35	75	47	52	55	57	58	25	N 420

General Rating

TABLE XIV

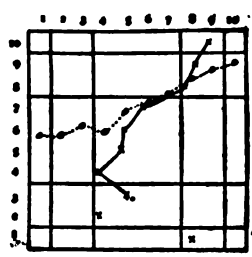


FIG. 10

Most of the qualities which rank in the lower half of the list have their correlation with general merit reduced for this same reason. A striking exception to this is the case of Professional Preparation, which ranks last. The distribution in this quality is shown in Table XIV and Fig. 10.

In Table XIV it is to be noticed that the majority of the teachers are rated Medium or below. The median General Rating corresponding to the various grades of Professional Preparation (dotted line, Fig. 10) drops from Good to Medium. The median Preparation of each grade of general excellence (solid line) drops from Good almost to Poor. The poorest teacher of all has very good professional preparation, being a normal graduate. The position of the curves would indicate more

correlation than the Pearson coefficient (0.38) gives. The low correlation is due to the widely scattered character of the distribution.

Experience.—The influence upon teaching ability of the number of years taught is much less than might be expected, judging from the importance laid upon it by those employing teachers. The facts in the case of the group of 411 teachers for whom we have information are shown in Table XV and Fig. 11. The median number of years taught by the 411 teachers is 6.2. Thirty-six per cent of the group had less than 5 years of experience. After the 2–4 year period the numbers are rapidly reduced. The curve showing the general merit corresponding to each group of years of experience rises to 18 years and tends downward from that point. That experience is positively related to merit for at least

EXPERIENCE

Years

General Rating	1	2	3	4	5–6	7–8	9–10	11–12	13–14	15–16	17–18	19–20	21–22	23–24	25–26	27–28	29–30	31–32	33–34	35–36	37–38	39–40	41+	No.
10	3	10	6	6	2	4	4	3	8	1	2	1		1										51
9	6	14	18	13	11	7	7	4	1		1	1												83
8	5	35	15	8	11	5	2	2	1		1													89
7	2	25	17	6	5	6	3	2		2			1	1										70
6	6	17	5	4	4	3	1	3	4	2		1										1		51
5	1	10	7	3	1	3	1	3	1		1				1									33
4	2	5	5	1		1	2		2		1													20
3		5	1	1						1				1		1								10
2		1	1					1																3
1			1																					1
No.	26	122	70	42	34	36	19	18	17	4	5	2	1	2	1	1						1		N 411

TABLE XV

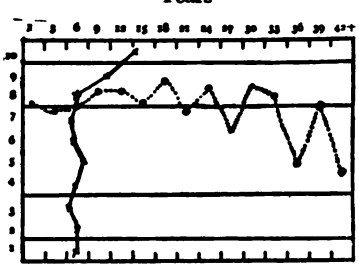


FIG. 11

part of a teacher's career is shown also by the relation line giving the median years of experience for each grade of merit. The medians fall from 14 years at Grade X to 5 years at Grade VIII. From that point on, however, there seems to be no relation between the two. The Pearson coefficient of correlation between experience and general merit is −0.08.

Validity of the correlations.—The coefficients which we have given as indicating the relations between the various qualities and general merit probably show quite accurately the relative importance of these factors as they are found in this group of teachers by these judges; but that the coefficients are accurate absolute measures of the relations either in teachers in general or in this group of 424 may very seriously be called in question.

Errors of selection: Errors of this kind are not serious as far as our present problem is concerned. They do, however, prevent the results from being universally applicable for the reason that our sample of the teaching population leaves out that very large part of it found in the small town and country schools. It has been our effort to secure the co-operation of the better judges of teachers in large towns and cities. In this limited field the selection is without doubt quite representative, but the number is a very small proportion of the whole teaching body they represent.

Errors of judgment: The greatest source of error is of course in the ratings themselves. Several factors conspire to make the ratings less reliable than they should be to give us absolutely accurate correlations. (1) In the first place, the ratings were, except in eight cases, the first ratings which the officers had made by this method. Greater familiarity with the scheme and more practice would give much more accurate results. (2) The varying standards of the judges have already been commented on. The ratings differ in reliability because some officers with low standards of excellence are easily satisfied and have rated their teachers high, while other officers, with teachers probably actually no worse, have rated their teachers lower because their standards of excellence are higher. (3) Allied to this is the unreliability of judges due to their inability to discriminate different grades of excellence.

The effect of different types of judgment is seen in Table XVI where the teachers in four schools, representing good and poor discrimination, are shown as distributed in three qualities representing low, medium, and high correlation. Schools IV*b* and XX show poor discrimination, while Schools III and XV show much better discrimination both in general ratings and in the qualities. That is, the type of judgment affects both the general and the particular ratings.

The general effect of these factors seems to be to make the ratings higher than the teachers really deserve. We find the General Ratings distributed as follows:

	Very Poor	Poor		Medium				Good		Excellent
Grade.....	1	2	3	4	5	6	7	8	9	10
Frequency.....	1	3	11	22	33	54	70	92	86	52

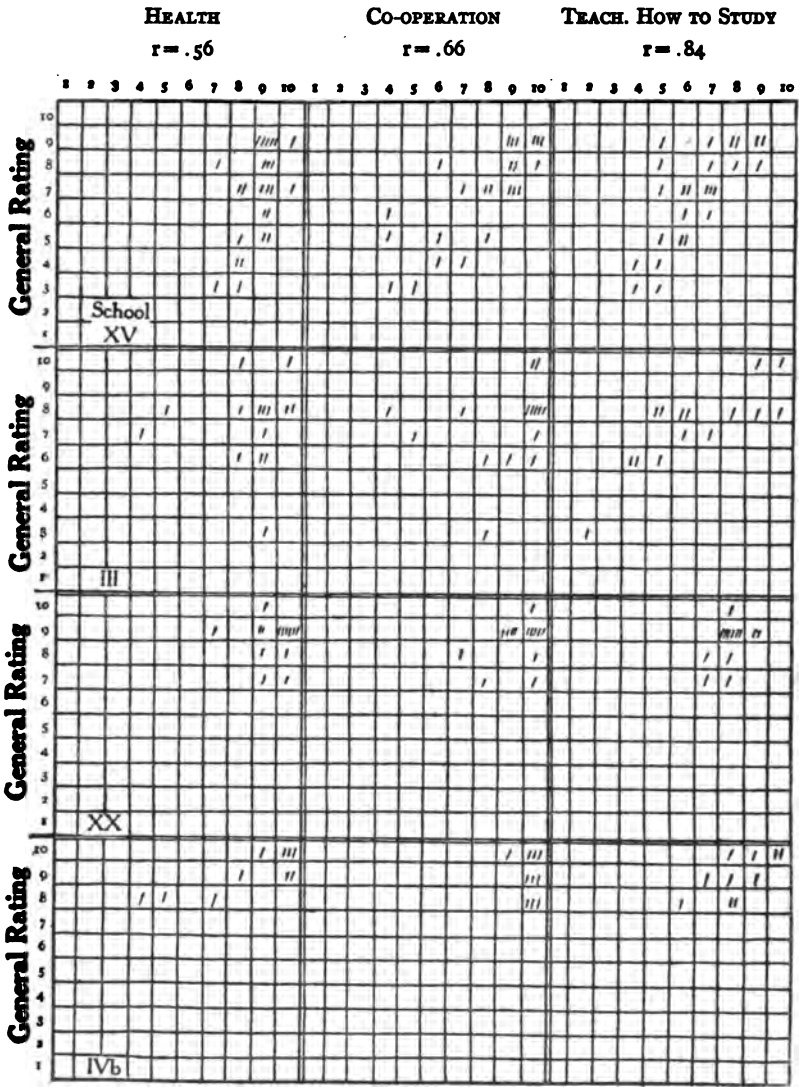


TABLE XVI.—Sample distributions from four schools showing effect of different degrees of differentiation.

Lack of discrimination and generous judgments have, therefore, tended to put teachers in the upper right-hand squares, nearer the diagonal of perfect correlation, thus raising the correlation for the group.

The obvious remedy for these difficulties is to have a body of competent judges trained to a common standard and have them judge the same body of teachers many times; but such conditions have so far been impossible to obtain.

Errors of manipulation: Mistakes in handling the figures in forming the frequency tables and in working out the correlations have, of course, been guarded against by checking them at every possible point. Certainly no constant errors of this kind have been present.

It is probable that the method of correlation employed has counteracted somewhat the effect of the high ratings mentioned above. Since the ratings were subject more or less to the constant error of tending toward sameness when they should have been more widely different, it is important that the method of correlation emphasize the differentiations that were made.

Results compared with other studies.—The results obtained by the present method agree with and confirm other studies of the same kind. Unfortunately, no two lists of qualities are the same, but, as far as comparison is possible, we find the following points common to the study by Ruediger and Strayer into qualities of merit in elementary teachers, to that of the present writer in the high-school field, and to the present investigation.

Rank of Quality	Present Study	Boyce—Study of High-School Teachers	Ruediger and Strayer—Study of Elementary Teachers
Instructional skill	1	1	2
Discipline	2	2	1
Initiative	3	3	3
Experience	6	4	4
General appearance	5	5	5
Health	4	6	6

These three studies confirm each other also as to the relation which experience bears to efficiency. The relation seems to be positive for a number of years during which efficiency increases with experience. This positive relation extends to 18 years in the present study, to 20 or 25 in Ruediger and Strayer's results, and to about 15 in the study of

high-school teachers. After this period, the latter part of which may be characterized by rather stationary efficiency, teaching ability begins to decline.

SUMMARY

1. The qualities apparently most important in the judging of teaching efficiency are those under the heads of "Results" and "Technique of Teaching."

2. The qualities least associated with general merit are Professional and Academic Preparation and the physical qualities of Health, General Appearance, and Voice.

3. Experience is not equally related to efficiency at all stages. Efficiency increases with experience for 15 or 20 years; after that period, efficiency does not increase in most of the cases of which we have records.

4. The validity of the correlations we have determined is much weakened principally by (1) the small number of cases, and (2) the difficulty of getting accurate ratings.

5. The results of the present study confirm those obtained by others as to the importance of the teacher's technique and her ability to get results.

CHAPTER VI

GENERAL SUMMARY AND CONCLUSIONS

The following points are apparently most important as resulting from our study of the problem up to this point.

1. The relative merits of teachers are determined almost altogether by some sort of "rating" or estimation by supervisory officers. For the most part this judgment is formed by general impressions and is not a result of an analysis of the situation.

2. The need for analysis is recognized by many schools, as shown by their methods of reporting efficiency. The weaknesses of these schemes now in use have to do principally with (*a*) their choice of terms, resulting in inadequate analysis, (*b*) the lack of definition of terms, resulting in vagueness and indefiniteness, and (*c*) the method of recording judgments, which is frequently wasteful of time or inaccurate or uncontrolled or all three.

3. The method of rating proposed in this study overcomes to some extent the difficulties involved by a comprehensive list of qualities, careful definition of terms, and the graphical method of recording judgments. When a large number of school officials use the scheme, however, the following weaknesses appear in the ratings: (*a*) Ratings which should be the same or nearly the same may differ widely because of differing standards of excellence in the minds of different rating officers. (*b*) School officials are not equally able to judge teachers and discriminate carefully between their various qualities.

4. The tests show that comparable and uniformly accurate reports on teaching efficiency are not to be had at present and that, to obtain them, supervisors have to be trained to a similar standard of excellence and given a common fund of information.

5. When the relation between general merit and the various qualities of merit is determined on the basis of ratings by the graphical method proposed, the following relations appear: (*a*) The supervisors co-operating in this study have put most emphasis on results obtained and technical skill displayed and least on the more general personal factors. (*b*) In general, increased professional preparation increases efficiency, but the correlation is low because of the widely varying preparation of the teachers rated. (*c*) Experience is positively related to efficiency for only part of a teacher's career.

APPENDIX

SAMPLE SCORE CARDS FOR RATING TEACHERS

Two sample score cards for rating teachers are here presented. The first is one proposed by Professor E. C. Elliott, of the University of Wisconsin. It is a tentative scheme for measuring teaching efficiency which has attracted much attention and which has been widely used as a pattern. A few places have been found to use the scheme as a whole.

The plan was originally presented in 1910. The copy given here is of the latest edition, which is not materially different from the first, except that the section "Supervisory Efficiency" has been added with a consequent rearrangement of the values.

PROVISIONAL PLAN

FOR THE

MEASURE OF MERIT OF TEACHERS

EDWARD C. ELLIOTT
The University of Wisconsin

City (District)..... School..... Room.....
Teacher..... Grade..... Subject.....

No. of Pupils.....Boys... Girls... Date.....

Special conditions.....

.....

GENERAL INSTRUCTIONS

Deduct from possible 10; very slight, 2; slight, 4; marked, 6; very marked, 7; extreme, 8. (Possible 20, 40, 60, 80, or 100, in same proportion.)

Total efficiency = Total Individual Efficiency *plus* Total Directed Efficiency.

Minimum standard for approval; according to the standards and exigencies of the school or school system.

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
I. PHYSICAL EFFICIENCY—80 units	(80)	.....	.....
1. Impressions—general.....	10	.....	.....
2. Health—general	20	.....	.....
3. Voice.....	20	.....	.....
4. Habits—personal.....	10	.....	.....
5. Energy and endurance; power of relaxation.	20	.....	.....

PROVISIONAL PLAN—*Continued*

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
II. MORAL—NATIVE EFFICIENCY—100 units	(100)	.....	.....
1. Self-control	20	.....	.....
2. Optimism—enthusiasm	20	.....	.....
3. Sympathy—tact	20	.....	.....
4. Industry—sense of responsibility	10	.....	.....
5. Adaptability	10	.....	.....
6. Sense of humor	10	.....	.....
7. Judicial mindedness	10	.....	.....
III. ADMINISTRATIVE EFFICIENCY—80 units	(80)	.....	.....
1. Regularity at post of duty	10	.....	.....
2. Initiative; resourcefulness	20	.....	.....
3. Promptness and accuracy	10	.....	.....
4. Executive capacity	20	.....	.....
5. Economy (time, property)	10	.....	.....
6. Co-operation (associates and superiors)	10	.....	.....
IV. DYNAMIC EFFICIENCY—180 units	(180)	.....	.....
1. Preparation. Including: (*a*) intellectual capacity; (*b*) academic education; (*c*) professional training; (*d*) command and use of English	20	.....	.....
2. Professional attitudes and interest	10	.....	.....
3. Human nature attitudes and interest (Appreciation of values—physical, intellectual, social, and moral, in child life)	10	.....	.....
4. Instructional skill	80	.....	.....
Including:			
a) Definiteness of aim and procedure			
b) Attention and interest of pupils			
c) Formality vs. vitality of instruction			
d) Motor vs. verbal methods			
e) Application of the technique of teaching; organization and presentation of subject-matter; the recitation as an *artistic* product			
f) Application of the technique of living; extent and quality of participation and contribution of pupils; the recitation as a *democratic activity*			
g) The tools and machinery of instruction; effective adaptation			
h) Assignment of work			
5. Responsiveness to directions and suggestions	20	.....	.....
6. Governmental and directive skill (discipline)	40	.....	.....
V. PROJECTED EFFICIENCY—50 units	(50)	.....	.....
1. Economical oversight of pupils not immediately under instruction	10	.....	.....

PROVISIONAL PLAN—*Continued*

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
2. Continuing preparation ..... (*a*) Daily; (*b*) Weekly; (*c*) Annual	10	.....	.....
3. The school program.....	10	.....	.....
4. Increase of professional equipment (professional association, study and reading; travel).....	20	.....	.....
VI. Achieved Efficiency—250 units	(*250*)	.....	.....
1. Respect of pupils and community.....	30	.....	.....
2. Leadership; stimulation of individuals and community.....	30	.....	.....
3. School achievement			
a) Responsiveness of pupils; readiness and accuracy.....	30	.....	.....
b) Illustrative results.....	80	.....	.....
c) Examinations; rate and amount of progress of pupils.....	80	.....	.....
VII. Social Efficiency—60 units.	(*60*)	.....	.....
1. Intra-mural interests.....	30	.....	.....
2. Extra-mural interests			
a) Cultural and ethical.....	10	.....	.....
b) Civic.....	10	.....	.....
c) School—patrons.....	10	.....	.....
Total Individual Efficiency.....	800	.....	.....

Directed Efficiency—200 Units	Suggested Values	Deficiencies	Determined Values
I. Supervisory Efficiency—200 units	(*200*)	.....	.....
1. Constructive criticism.....	40	.....	.....
2. Non-interfering supervision.....	40	.....	.....
3. Community encouragement.....	40	.....	.....
4. Professional confidence.....	40	.....	.....
5. Recognition of individuality.....	40	.....	.....
Total Directed Efficiency.....	200	.....	.....

SUMMARY

Determined Individual Efficiency..... ..... units
Determined Directed Efficiency..... ..... units

Total Efficiency..... ..... units

SPECIAL NOTE

It is believed that this analytical plan for the study of teaching merit will be of the greatest service if placed directly in the hands of teachers for their own guidance, and as a basis for co-operative effort between teachers and supervisors. *The plan is not intended to be used as a score card by inspectors.*

While the numerical values assigned to the several items are thought to represent general proportional worths, they may be considered as arbitrary, and as affording merely a convenient device for the recording of objective judgments and for the better diagnosis of defects.

(Copyrighted, 1914, by Edward C. Elliott)

The second score card is one used by certain representatives of the New York Bureau of Municipal Research in some of their investigations. The contents of the front and reverse of the card are shown on pp. 82–83.

SCHOOL	GRADE	H. S. YEAR	TEACHER	DATE

I. PERSONALITY OF TEACHER (Check ✓)

ILLUSTRATIONS

1. Teacher appears to be

vigorous.....	weak.....
poised.....	nervous.....
neat.....	slovenly.....
at ease.....	embarrassed...

2. Voice is (Check ✓)

pleasing.....	harsh.....
clear.....	indistinct.....
low.....	high.....

3. In her personal relations with pupils does she appear (Check ✓)

to stimulate.....	to suppress.....	courteous.....	rude.....
to win cordial co-operation.....	to antagonize....	encouraging.....	nagging.....
to be sympathetic	harsh.....	firm.....	weak.....
strict.....	lax.....	tactful.....	blundering.....
even tempered...	irritable.....	enthusiastic.....	diffident.....
reasonable.....	unreasonable.....	quick to react....	slow to react.....
tolerant.....	intolerant.....	quiet.....	noisy.....
dignified.....	undignified.....	systematic.....	disorderly.....
		resourceful.....	dependent.....

ILLUSTRATIONS

II. THE RECITATION

ILLUSTRATIONS

1. No. of pupils in class appearing

to be interested.....	indifferent.....
energetic.....	lazy.....
independent.....	dependent.....

2. Responses of pupils: No. giving

(*a*) fluent topical recitations.....
(*b*) word or phrase responses.....
(*c*) sentence responses.....
(*d*) incoherent responses.....
(*e*) failing to answer.....

3. No. of pupils in section

not reciting....reciting once....twice....
three times....more than three times....

4. No. pupils in room but not in reciting section.....

No. industrious.....	indolent.....
minding their own business.....	
interfering with others.....	

5. No. of pupils asking

pertinent questions of fact.....
relevant thought-provoking questions.....

6. Time lost (Check ✓ under yes and no)

	Yes	No.	No. Min.
(*a*) Calling class.....			
(*b*) Dismissing class.....			
(*c*) Distributing materials.....			
(*d*) Indistinct speech of teacher.....			
(*e*) Indistinct speech of pupils.....			
(*f*) Unnecessary talking of teacher...			
(*g*) Unnecessary talking of pupils...			
(*h*) Failure to have devices ready...			
(*i*) Use of ill-adapted devices.....			

ILLUSTRATIONS

(Reverse side)

(Check ✓)

II. 7. Teaching Ability as shown by	Not at all	Slight	Medium	Notable	Evidence and Remarks
a) Extent to which teacher's questions are					
(1) thought-provoking					
(2) calling for facts					
(3) suggesting the answer					
(4) answered by "yes" or "no"					
(5) irrelevant					
(6) not definite—vague					
b) Extent to which material of recitation is					
(1) confined to text					
(2) within pupil's comprehension					
(3) related to children's lives and experiences					
(4) adapted to children's present or future needs					
(5) worth while					
c) Extent to which the teaching					
(1) is rambling					
(2) is formal, mechanical					
(3) stimulates initiative of pupils					
(4) requires independent thinking					
(5) develops pupil's resourcefulness					
(6) requires co-operation of pupils					
(7) is fixed on essentials					
(8) requires pupils to organize material					
(9) utilizes children's experience					
(10) clears up pupils' difficulties					
(11) shows use of material in solution of present or future problems					

(Check ✓)

Teaching Ability	N.	S.	M.	N.	Evidence and Remarks
d) Extent to which pupils					
(1) had a clear idea of purposes of lesson					
(2) were self-reliant					
(3) tested their own solutions					
(4) acted and thought on their own account					
(5) co-operated with teacher and classmates					
(6) persisted in getting desired result					
(7) differentiated between essentials and non-essentials					
(8) organized their material					
(9) seemed well grounded in previous work					

8. Was the assignment	Yes	No
a) definite and clear?		
b) related to present lesson?		
c) such that the pupils were prepared to attack it intelligently?		
d) formal—from textbook?		
e) by topics or problems?		
f) hastily made at dismissal?		
g) omitted?		

9. Correction of essential errors

(1) **Describe method used**.....

(2) Are nonessential errors **too much emphasized**?.....

(3) What record is kept of **recurring errors likely** to retard progress of **pupils**?.....

THE FIFTEENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

PART I

STANDARDS AND TESTS FOR THE MEASUREMENT OF THE EFFICIENCY OF SCHOOLS AND SCHOOL SYSTEMS

THIS PART OF THE YEARBOOK WILL BE DISCUSSED AT THE DETROIT MEETING OF THE NATIONAL SOCIETY, MONDAY, FEBRUARY 21, 1916, 8:00 P.M. IT WILL ALSO BE DISCUSSED AT THE DETROIT MEETING OF THE NATIONAL COUNCIL OF EDUCATION

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BY

G. D. STRAYER, BIRD T. BALDWIN, B. R. BUCKINGHAM, M. R. TRABUE
F. W. BALLOU, D. C. BLISS, H. G. CHILDS, S. A. COURTIS
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Edited by GUY MONTROSE WHIPPLE, *Secretary*

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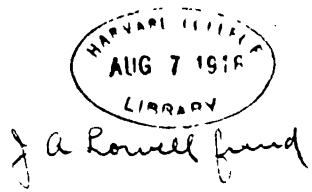

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EDITOR'S PREFACE

It will be recalled that the National Society for the Study of Education one year ago published as its *Fourteenth Yearbook*, Part I, the 1915 report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, Superintendent H. B. Wilson, chairman. It was anticipated at that time that the policy of this Society in publishing Yearbooks *before* the meeting at which they were to be discussed would measurably augment interest in the report and increase the effectiveness of its discussion. This anticipation was so fully realized that, now that the further report of the Committee on Economy of Time has been unavoidably delayed, it is a matter of satisfaction to be able, nevertheless, to continue our policy by presenting to our members, as Part I of the *Fifteenth Yearbook*, the report of another important committee, the Committee of the National Council of Education of the National Education Association on Standards and Tests of Efficiency, Professor G. D. Strayer, chairman.

The perusal of the Table of Contents will suffice to show that this Yearbook maintains the high standards set by its predecessors in the selection of subject-matter that bears directly upon educational problems of recognized importance and in the selection of contributors that guarantee a presentation worthy of careful consideration.

G. M. W.

INTRODUCTION

In the pages which follow, the Committee on Standards and Tests of the National Council of Education presents a series of reports prepared by its own members and by others who have, upon invitation of the committee, been willing to contribute results of their study or investigation. The committee feels that these reports furnish most satisfactory evidence of the progress which has been made in the field of educational measurement during the past few years. The papers of the several contributors may, in general, be classified as contributing (1) to the derivation of scales or units of measurement, and (2) to the application of such units or scales of measurement as have been derived in the field of educational administration or supervision. In printing, the papers have been grouped as indicated above.

It seems unnecessary with this report in hand to argue in favor of the use of the more precise methods of measurement which have recently been developed. Those interested in the improvement of our schools have always attempted by some method or other to estimate the efficiency of individual schools or school systems. Often this measurement has been based upon an opinion not acceptable to another student or investigator, and not frequently upon attempts to measure which have been extremely crude. The examination system as we have commonly had it, not only has been responsible for judgments with respect to the efficiency of schools, or of school systems, but has also determined in very considerable measure in most school systems the progress of children. In the studies which are reported here, more precise measures give to the student of education a better basis in knowledge of conditions upon which to base his criticism or to develop his improved method of instruction or administration. The measurement of results of any sort, whether of the achievements in school subjects, of the cost of any unit or function, or of the rate of progress, and the like, furnishes primarily a knowledge of the situation which makes clear the problems involved, and which may suggest a method of experiment that looks toward the improvement desired.

Regardless of the development which may be made in the field of measurement, we shall always have to deal with the problem of aim in

education. Those who have done most to develop precision in measurement, or who have profited most by using the units or scales, would be the last to deny the worth of that thinking and discussion which leads to a determination of the ends to be realized in our schools. When one has defined purposes or ends to be achieved, efficiency, in the light of these aims, can be determined only as we are able to measure the degree to which improvement or growth has taken place. Indeed, education may be best defined in terms of changes which are brought about in the individuals subjected to the process. If our aims mean anything to those who teach, they are or are not satisfied, in proportion as measurable changes are brought about in pupils. The more precisely we are able to measure the development which is brought about by virtue of our school work, the more certain we may be that we are realizing the aims which we have set up, and it is only by means of some sort of measurement that we may even claim to have made progress in the accomplishment of those ends which we profess to seek.

GEORGE DRAYTON STRAYER, *Chairman*

PART I

EDUCATIONAL SCALES AND UNITS OF MEASUREMENT

CHAPTER I

A MEASURING SCALE FOR PHYSICAL GROWTH AND PHYSIOLOGICAL AGE

BIRD T. BALDWIN
Professor of Psychology and Education, Swarthmore College

A comparative study of the results of four hundred investigations on over one million individuals shows that the height, weight, and lung capacity of children vary according to nationality, heredity, general social status, urban and rural conditions, geographical distribution, season of the year, normal and abnormal mentality, health, sex, initial size, and stages of physiological maturity. Among the marked modifying factors which have, to a considerable extent, made data incomparable are to be found the manner in which measurements have been taken and recorded; the personal equation of trained and untrained examiners; the varying degrees of accuracy of measuring apparatus; the age of the child, as based on exact birthday, last birthday, or next birthday, with or without months, weeks, and days being taken into consideration; and the measurement of children with or without clothing.

This paper aims to formulate tangible norms which may be used by physical directors and teachers as standards for comparison with all types and races of children between the ages of five and one-half and eighteen years. The norms are based on the best available data in this country from the Horace Mann School, the Francis W. Parker School, and the University Elementary and High schools of the University of Chicago, where a limited number of American children were measured consecutively for several years by trained anthropometrists using standardized apparatus of minute units, with the age recorded exactly in days. Details and

source material have been published elsewhere,[1] but the material and charts included in this article are new and supplementary to the previous larger study.

GENERAL PRINCIPLES OF GROWTH

These norms, in accordance with facts previously published by the writer, conform with the conclusions that: Boys are taller, heavier, and have better lung capacity than girls except during the early adolescent period, when the converse of this statement is true. The widest ranges of individual differences and the largest increments of growth are during adolescence. Individual growth curves previously published show that in the course of growth short children do not become tall, neither do tall children become short, under normal conditions; each child holds his or her relative position in reference to a given median or norm throughout the school age—that is, in a well-developed child weight, height, and lung capacity are relatively proportionate to each other. If a child's weight is divided by its height, the *weight-height coefficient* is found, which is approximately the same for a well-developed large child or a similarly well-developed small child; the same relationship holds true for the breathing capacity and height or the so-called *vital-height coefficient*. (See score card for norms.)

STAGES OF PHYSIOLOGICAL MATURATION OR PHYSIOLOGICAL AGE

Growth is a continuous process, but some periods in the life of a child are marked by more acceleration than others. The period from six to seven and a half is a period of rather rapid growth in height. Boys and girls above median or average height between the ages of six and eighteen grow in stature and physiological maturity in advance of those below the median or average height. There is a shifting of the accelerated period according to the individual's relative height, weight, and lung capacity.

Our study of thirty thousand measurements in height, weight, and lung capacity reveals correlations in growth for boys and girls above the median or average height different from those below. The rhythms and fluctuations of growth in height for the children above the median show that these boys and girls are physiologically older than those

[1] B. T. Baldwin, "Physical Growth and School Progress," *U.S. Bureau of Education, Bulletin No. 10*, 1914. Whole No. 581. 215 pp.

below the median, since their periods of acceleration and arrest begin earlier and end earlier. Short children continue their growth longer than tall children.

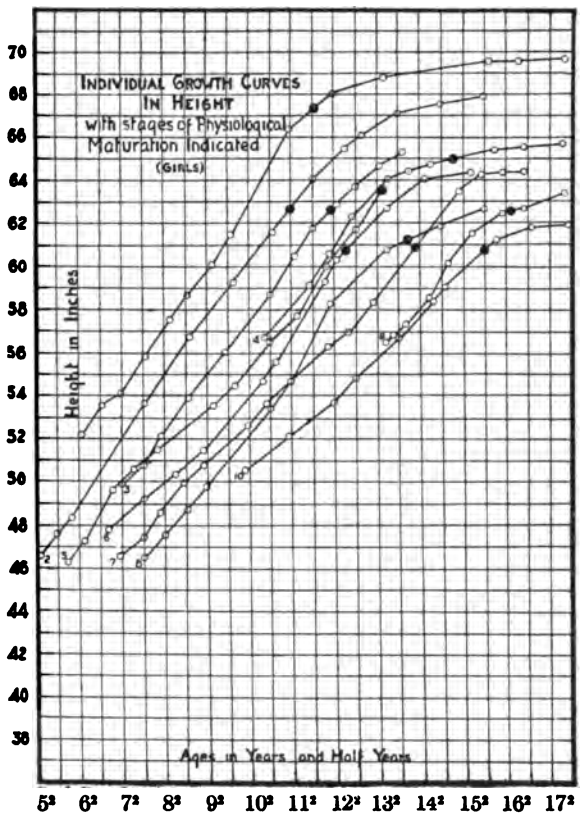

CHART I.—Individual growth-curves

This conclusion may be substantiated in another way. Chart I gives individual growth-curves and the periods of first menstruation of some girls who were selected, on the basis of height only, from a larger group. A study of these curves will show that the taller girls, as a rule, mature earlier than the shorter ones, as shown by the distribution of the advent of first menstruation. It would appear, therefore, that

height, weight, and breathing capacity offer good objective criteria for determining this factor in pubescent development and the onset of maturity. If the girl is tall, healthy, and well nourished, this physical stage may be reached as early as eleven years in a normal girl; if she is tall, but under weight, it may be delayed; if she is very short and markedly light, it may be delayed until sixteen and one-half years of age.[1] This principle of growth has recently been upheld by Weissenberg,[2] who found girls who menstruated before thirteen years of age were, on the average, 150.5 centimeters tall, and those who had not developed so far at fifteen years of age were, on the average, 144.5 centimeters tall. In his study of 1,273 Jews and 768 Russians he found the average of this stage of maturation to be for the Jews fourteen years and two months, and for the Russians fourteen years and eleven months. Jamasaki found the age to be fifteen for Japanese girls and seventeen for Chinese, on the average. All of these are relatively short peoples. These differences in ages are no doubt also greatly influenced by racial and climatic conditions.

In order to determine the wide range of ages which are characteristic of the stages of physiological growth which are entered into at the age of adolescence, the writer and one of his advanced students at Johns Hopkins University, Charles F. Pennington, checked very carefully some material that was gathered by Director William Burdick and Dr. Brown on the ages of pre-pubescence, pubescence, and post-pubescence in boys.[3] In Baltimore 3,600 boys of a "motor" type of development, that is, those taking part in athletics, were examined and checked by Dr. Burdick and supplemented by a group of 1,317 boys from 14 counties of Maryland. Various criteria have been used to determine the age of pubescence, such as examination of the teeth, the bones of the wrist, the change of voice, the color of the eye, and the acceleration in height, weight, and lung capacity. With this particular material the

[1] The coefficient of correlation for these ten cases by the Spearman Formula, $R = 1 - \frac{\Sigma g}{(n^2-1)}$, is .697.

[2] S. Weissenberg, *Das Wachstum des Menschen*. Stuttgart: Strecker und Schröder, 1911. 220 pp.

[3] These data were collected under the auspices of the Baltimore Public Athletic League of which Mr. Robert Garret is chairman and Drs. Burdick, Brown, Horrax, and Thompson are medical supervisors.

criterion was that of pubescent growth and pigmentation of fine hair, which characterizes a very brief period of time marking the change from asexual to sexual life, when the ability to procreate is established.

Chart II (see p. 16) gives the results of this investigation. Curves 1, 3, and 5, solid lines, represent the 1,317 country boys. Curves 2, 4, and 6, dotted lines, represent the 3,600 city boys. It will be noticed that the pre-pubescent boys range from eight and one-half to sixteen years of age in the group of country boys, and from nine and one-half to seventeen and one-half for the city boys. The post-pubescent ages range from eleven and one-half to twenty-four for the country boys and twelve and one-half to twenty-four for the city boys. For the pubescent stages the country boys range from nine and one-half to fifteen and one-half, with the mode at thirteen and one-half, and the city boys from ten to eighteen, with the mode at fourteen. The average is 13.86 years for the country boys and 14.40 years for the city boys. Crampton[1] found the mean age for pubescence (maturing) for New York boys to be 13.44 years, with a range from twelve and one-half to seventeen and one-half years.

The table shown on p. 17 gives the distribution of 1,241 pre-pubescent, pubescent, and post-pubescent girls from the Baltimore Public Athletic League where the criteria were the menstrual flow, the appearance of subcutaneous fat, enlargement of the breasts, and axillary hair.

All this material indicates that averages are of little value in the study of physical development. What is needed are individual growth records, for each individual must be studied on the basis of his own development. Two children fifteen years of age may vary from each other at least four years in their stages of physiological development—a fact which should be taken into consideration in all educational work, whether physical or mental. The results of the writer's previous study show that the stages of physical and mental maturity are parallel, irrespective of precocity or brightness; therefore, the obvious educational corollary is that our school systems, public and private, should take into careful consideration *the physiological age and the accompanying stages of mental maturity* of boys and girls, rather than the chronological age and brightness, as is now done. This would require that tall,

[1] C. W. Crampton, "Anatomical or Physiological Age versus Chronological Age," *Ped. Sem.*, XV, 230–37.

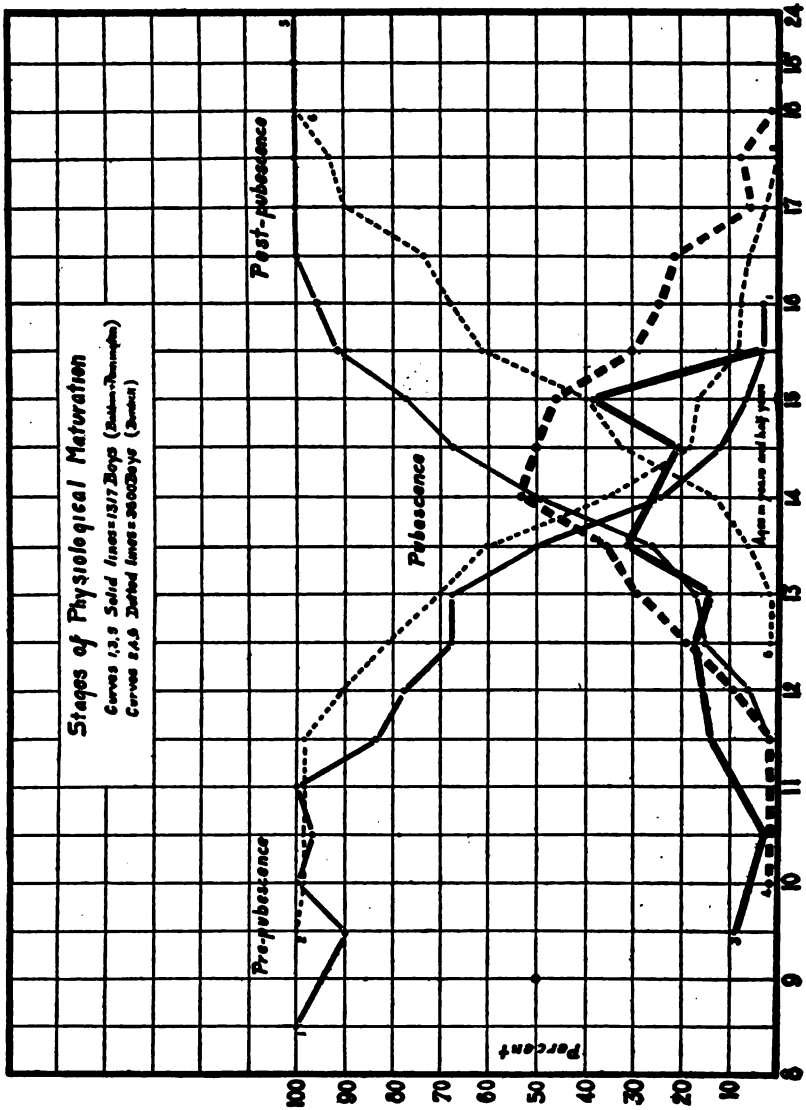

CHART II.—Distribution chart of pre-pubescent, pubescent, and post-pubescent boys

healthy children of accelerated physiological development be encouraged to proceed through school as rapidly as possible within the limits of thoroughness, and that the small, light children of retarded physiological

APPEARANCE OF PUBESCENT CHANGES IN 1,241 GIRLS

Age	No. Pre-pubescent	Percentage	No. Pubescent	Percentage	No. Post-pubescent	Percentage
6½	4	100.0	.....	.....	.....	.....
7	12	100.0	.....	.....	.....	.....
7½	16	100.0	.....	.....	.....	.....
8	6	100.0	.....	.....	.....	.....
8½	26	100.0	.....	.....	.....	.....
9	22	100.0	.....	.....	.....	.....
9½	37	100.0	.....	.....	.....	.....
10	26	100.0	.....	.....	.....	.....
10½	45	93.75	3	6.25	.....	.....
11	27	100.0	.....	.....	.....	.....
11½	41	78.84	10	19.23	1	1.92
12	18	62.06	11	37.93	.....	.....
12½	39	58.20	16	23.88	12	17.91
13	17	39.53	15	34.88	11	25.58
13½	10	15.15	25	37.87	31	46.96
14	10	15.38	25	38.46	30	46.15
14½	3	4.83	11	17.74	48	77.42
15	.....	.....	8	14.54	47	85.45
15½	1	1.55	5	7.81	58	90.62
16	1	2.04	3	6.12	45	91.83
16½	.....	.....	2	3.17	61	96.83
17	.....	.....	.....	.....	43	100.0
17½	.....	.....	.....	.....	43	100.0
18	.....	.....	.....	.....	32	100.0
18½	.....	.....	.....	.....	33	100.0
19	.....	.....	.....	.....	9	100.0
19½	.....	.....	.....	.....	25	100.0
20	.....	.....	.....	.....	15	100.0
20½	.....	.....	.....	.....	18	100.0
21	.....	.....	.....	.....	4	100.0
21½	.....	.....	.....	.....	14	100.0
22+	1 (22 yrs.)	.60	.....	.....	165	99.4
Total	362	.....	134	.....	745	.....
Grand total	.....	.....	.....	.....	1,241	

development be kept below or in the normal grade, doing supplementary work, *since these short, light pupils are immature in mental development, although in many cases precocious in degree of brightness.* It also follows from this study that rapid, healthy growth favors good mental

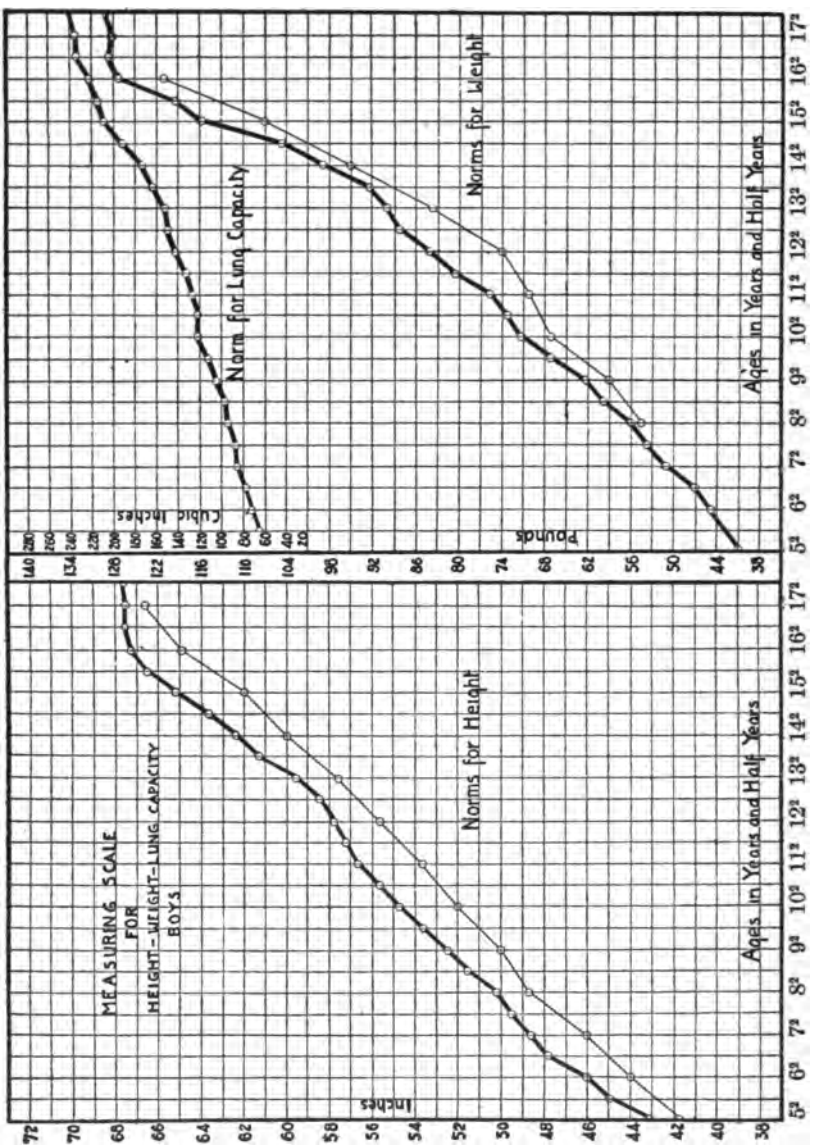

CHART III.—Average growth-curves in height, weight, and lung capacity. The heavy lines are Baldwin's and the light lines are those of Boas. (Place the child's measurements in the assigned spaces on the card and plat the growth-curves on this chart from year to year.)

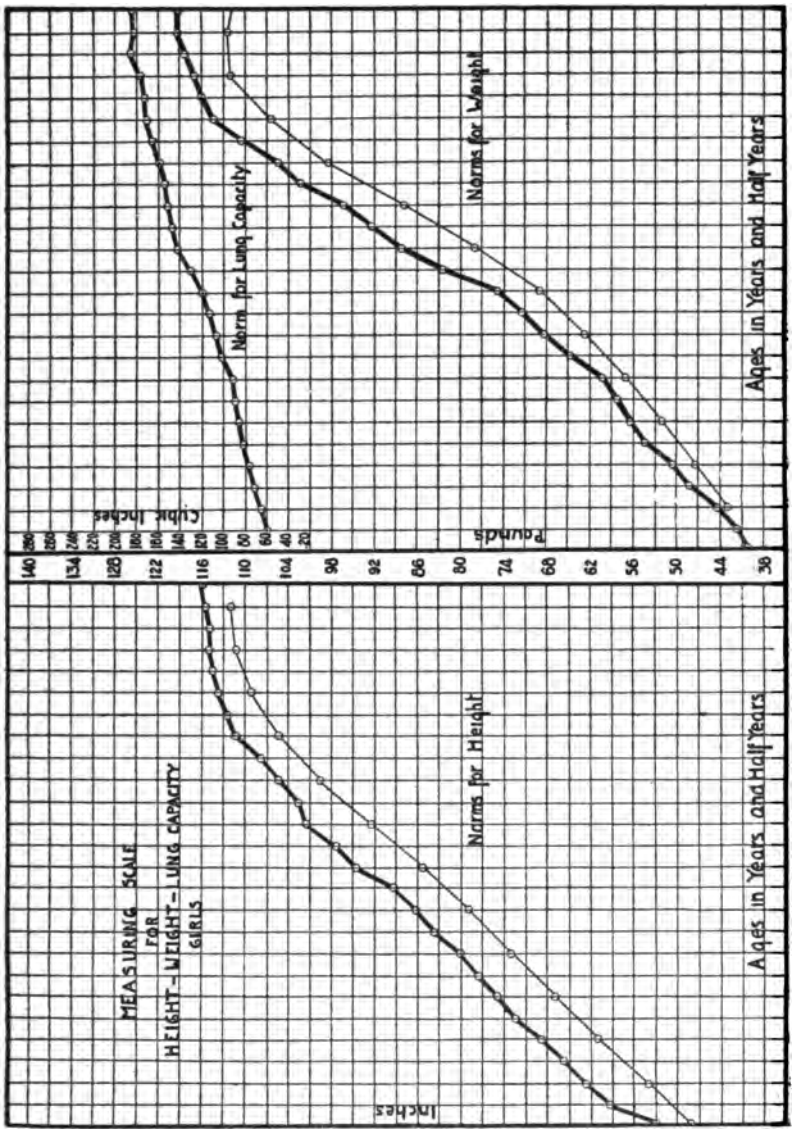

CHART IV.—Average growth-curves in height, weight, and lung capacity. The heavy lines are Baldwin's and the light lines are those of Boas. (Place the child's measurements in the assigned spaces on the card and plat the growth-curves on this chart from year to year.)

MEASURING SCALE FOR PHYSICAL DEVELOPMENT (GIRLS)

English System — Form I

Name..... Schools.....

Date of Birth..... Nationality..... Examiners.....

Date of examination													
School year	Kg.	1		2		3		4		5		6	
Age	5ª	6	6ª	7	7ª	8	8ª	9	9ª	10	10ª	11	11ª
Norm in inches (Height)	42.9	45.2	46.3	47.2	48.3	49.4	50.4	51.1	52.0	53.3	54.0	55.2	56.9
Weight-height coefficient	.93	.92	.95	1.02	1.04	1.11	1.13	1.13	1.18	1.22	1.33	1.36	1.49
Norm in pounds (Weight)	40.1	41.7	44.2	48.1	50.4	54.7	57.1	57.5	61.5	64.8	71.7	74.9	82.8
Norm in cubic inches (Breathing capacity)	40.0	60.0	63.0	71.3	77.9	81.8	83.5	87.3	91.7	100.9	106.7	114.0	119.0
Vital-height coefficient	.93	1.33	1.36	1.51	1.61	1.65	1.66	1.71	1.76	1.89	1.98	2.07	2.09

Date of examination													
School year	7		8		9		10		11		12		
Age	12	12ª	13	13ª	14	14ª	15	15ª	16	16ª	17	17ª	
Norm in inches (Height)	57.7	59.3	59.5	60.5	61.3	62.5	62.6	63.3	63.5	63.7	63.4	63.9	
Weight-height coefficient	1.51	1.55	1.62	1.69	1.73	1.76	1.84	1.83	1.84	1.85	1.86	1.87	
Norm in pounds (Weight)	87.1	91.8	96.4	102.3	105.8	110.3	115.3	115.6	116.9	117.9	119.0	119.0	
Norm in cubic inches (Breathing capacity)	128.0	141.3	146.2	147.7	153.5	158.8	164.5	172.6	176.5	178.8	183.0	185.0	
Vital-height coefficient	2.22	2.38	2.46	2.44	2.50	2.54	2.63	2.73	2.78	2.81	2.89	2.90	

These norms represent well-developed children with school-medical inspection and physical training. A small child (or a given age may be well developed if the *coefficients*, height, weight, and breathing capacity relationships, are normal and approximate those indicated. The formula is

Weight÷height=weight-height coefficient.
Breathing capacity÷height=vital-height coefficient.
For example. For 5 years, 41 lbs÷43 in.=.95=weight-height coefficient.
In the metric system use height in centimeters, weight in kilograms, and breathing capacity in liters. The English weight-height coefficient norms × 1.179 = metric weight-height coefficient norms. The English vital-height coefficient norms × .00645 = metric vital-height coefficient norms.

School year..... 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12

Health..... | Vision..... | Hearing.....

Vaccination..... | Glands..... | Posture.....

Note: G=Good M=Medium P=Poor C=Corrected

MEASURING SCALE FOR PHYSICAL DEVELOPMENT (BOYS)

English System — Form I

Name..... Schools.....

Date of birth..... Nationality..... Examiners.....

Date of examination													
School year	Kg.	1		2		3		4		5		6	
Age	5ª	6	6ª	7	7ª	8	8ª	9	9ª	10	10ª	11	11ª
Norm in inches Height	43.0	45.4	46.6	47.9	48.3	49.5	50.1	51.4	52.2	53.6	54.8	55.3	56.7
Weight-height coefficient	.95	.95	.96	.98	1.07	1.09	1.12	1.17	1.19	1.23	1.30	1.33	1.33
Norm in pounds Weight	41.0	42.9	44.8	46.9	51.7	54.2	55.9	60.4	62.1	66.9	71.4	73.2	75.5
Norm in cubic inches Breathing capacity	50.0	65.6	70.0	77.2	82.4	85.6	92.6	95.7	105.9	111.5	123.2	121.6	126.2
Vital-height coefficient	1.160	1.44	1.50	1.61	1.71	1.73	1.85	1.86	2.03	2.05	2.25	2.21	2.22

Date of examination													
School year	7		8		9		10		11		12		
Age	12	12ª	13	13ª	14	14ª	15	15ª	16	16ª	17	17ª	
Norm in inches Height	57.1	57.8	58.2	59.5	61.0	62.2	63.7	65.1	66.3	67.4	67.5	67.5	
Weight-height coefficient	1.42	1.46	1.52	1.51	1.55	1.59	1.63	1.78	1.79	1.88	1.90	1.88	
Norm in pounds Weight	81.0	84.6	89.5	90.0	94.9	98.9	104.9	115.9	118.9	127.1	128.5	127.0	
Norm in cubic inches Breathing capacity	134.0	140.5	150.8	152.9	162.5	173.8	191.7	210.0	212.6	222.6	236.4	238.0	
Vital-height coefficient	2.35	2.52	25.9	2.57	2.66	2.79	3.00	3.23	3.21	3.30	3.50	3.53	

These norms represent well-developed children with school-medical inspection and physical training. A small child for a given age may be well developed if the *coefficient*, height, weight, and breathing capacity relationships, are normal and approximate those indicated. The formula is

Weight + height = weight-height coefficient.
Breathing capacity + height = vital-height coefficient.
For example. For 5 years, 41 lbs. + 43 in. = .95 weight-height coefficient.
In the metric system use height in centimeters, weight in kilograms, and breathing capacity in liters. The English weight-height coefficient norms × .170 = metric weight-height coefficient norms. The English vital-height coefficient norms × .0645 = metric vital-height coefficient norms.

School year..... 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12

Health..... Vaccination..... | Vision..... Glands..... | Hearing..... Posture.....

Note: G = Good M = Medium P = Poor C = Corrected.

development, and therefore that the healthy growing child should have plenty of physical and mental exercise.

THE MEASURING SCALE

In order that teachers, principals, superintendents, physical directors, and parents may have a basis for comparison in the study of physical development, the writer has formulated norms for physical growth in height, weight, and lung capacity, and expressed them on the accompanying cards (pp. 20–21), which may be used as a *measuring scale* for physical growth and stages of physiological maturity, as well as for records concerning physical conditions. The norms are high, representing the best developed children available, who have had physical training, school-medical inspection, directed play, and remedial treatment where necessary. A child who falls short of these standards is not necessarily subnormal physically, providing its weight and breathing capacity are proportionate to its height. The weight-height coefficients and the vital-height coefficients indicated on the card under their respective ages mark the norm to which all well-developed children should approximate.[1] All these norms are based upon measurements of nude children.

[1] Measuring scales for the growth of boys and girls have been prepared in the metric system and may be had from the writer on application. An illustrated leaflet describing methods of measuring and tests for nutrition, vision, hearing, neck-glands, and posture may also be obtained from the writer.

CHAPTER II

NOTES ON THE DERIVATION OF SCALES IN SCHOOL SUBJECTS: WITH SPECIAL APPLICATION TO ARITHMETIC

B. R. BUCKINGHAM
Chief Statistician, Department of Education, New York City

The movement to set up objective means of measuring school products, which has been so characteristic of recent educational practice, has plainly demonstrated the necessity for more and better instruments of measurement. It is in response to this need that standards of achievement have been set up, and scales have been derived. The latter have been of two kinds—those based upon the judgment of competent persons, and those based upon the ratio of correct to total responses in a typical group. The validity of each of these bases has been questioned, but not successfully. The superiority of the one over the other has been argued, but not conclusively. In fact, there is no opposition between them.

The determination of the ratio of correct responses to total responses is also, to some extent, dependent upon individual judgment, because it is frequently a matter of opinion whether a response is correct or not. In the matter of spelling, for instance, it is not always easy to say whether a given form is or is not to be scored as correct. Again, in arithmetic, which, like spelling, is capable of relatively precise rating, it is frequently difficult to decide whether the answer to a problem should be rated as correct. In such cases readers of papers will differ somewhat in their conclusions. In other words, the element of individual judgment plays a part. Furthermore, such subjects as geography, history, and English offer much greater degrees of difficulty in the application of that precision of rating upon which the ratio method of deriving scales is based.

Finally, in the gradation of school subjects from the most definite subjects (spelling and arithmetic) to the least definite ones (penmanship, drawing, and English composition), we reach subjects in which the element of certainty is at a minimum, and judgment plays its most important rôle.

The point which I am seeking to make is this: that there is no opposition between scales based upon judgment and those based on the ratio of correct to total responses, and that each method of derivation is most appropriate at the extremes of a series of school subjects ranging from most definite to least definite.

On the score of penmanship, drawing, and English composition, a given specimen of work is superior to another, not because it is more correct, but just because people think it is superior. On the other hand, in the case of spelling, a list of words written by one child is better in point of spelling than a list written by another child, not because a number of judges think it is the better, but because there are actually more words spelled correctly in it.

In those subjects that range between the extremes of definiteness (such subjects, namely, as geography, history, and grammar) it will be evident that there is place for both the judgment and ratio methods of scale-derivation. In each of these subjects there are certain parts which are so definite and about which people differ so little that there is small room for variation in judgment. In geography, for example, locational features are of this type. It is no more possible for people to differ about the state of the United States in which Kalamazoo is than it is for them to differ about the correct spelling of "separate" or the product of seven and nine. Similarly, in history, the question "In what year was the Stamp Act passed?" admits of no debate. And, again, in grammar, the direction "Give an example in a sentence of an adverb of time, and underline it" admits of responses which may be classified, with practical certainty, as either right or wrong.

It will be noted that the questions just mentioned call for responses based on information, and it is a fact that most questions which may be rated with precision as either right or wrong are of this kind. It is obvious, however, that a large part of geography, and perhaps a still larger part of history and grammar, cannot be covered by questions of this character. Indeed, the most valuable training to be derived from these subjects is based upon the opportunity which they afford for comparison, for inference, and for judgment.

But there is no good reason why scales based upon the ratio idea should not be derived for those phases or parts of these subjects that are susceptible of the precise treatment which the ratio idea requires. In fact, it is becoming increasingly evident that the present general scales

will have to give place to more specific ones, each scale being suitable for a particular purpose and applicable to a given condition or situation. We shall have scales for each grade in spelling, scales for the several styles of handwriting, and scales for each type of discourse in composition. Why, then, should we not have scales for information in geography, history, and grammar?

The suggestion may be made at this point that in using scales based upon information, we may not only directly measure ability to give information, but we may also indirectly measure ability of a more general sort, including the power to think. Work is now being done on the problem of the correlation between information and general ability within a school subject. From present indications there is reason to suppose that the correlation is high—probably not less than 0.80. If this is substantiated by sufficient data, it then becomes reasonably easy to measure something like general ability in a given field in terms of a scale derived from questions of information.

The practicability of indirect measurement is demonstrated in many of our ordinary measurements. We do not measure, for instance, the heat of the atmosphere, but, rather, the length of a mercury column, which varies directly with the amount of heat to which it is subjected. We do not measure the health of a child, but, rather, his vital index, because we either know, or think we know, that his health varies approximately with this index.

When we use the phrase "varies directly," we are stating a condition which involves perfect correlation. No such perfect correlation, of course, exists between mental processes. A measure, therefore, of one process, trait, or ability in terms of another, is liable to a margin of error to the extent that the correlation is imperfect. If we may assume that the correlation between information and thought-power in geography is 0.80, we cannot get a perfect measure of "thought-power" from "amount of information," but we can get a measure which differs from the true one by an amount small enough to be negligible for many practical purposes.

With these ideas in mind, an investigation was begun in the fall of 1913, which had for its purpose the development of standardized material and the derivation of scales in the subjects of arithmetic, geography, history, and grammar, upon the basis of the ratio of correct to total responses to given questions. It is to be understood that in the rating

of pupils' papers, all answers were scored as either correct or not correct, and that no part credits were given.

The report herewith submitted is preliminary and fragmentary. It is preliminary because it is not believed that a sufficient number of cases have been scored to make the conclusions as reliable as they should be. It is fragmentary because results are shown only for the subject of arithmetic, and within this subject, for only a portion of the questions that were used. It is offered here as an example of the extension to a wider field of a previously used method.

The problems used in this report were given to seventh- and eighth-grade children in eight schools in New York City, and to children of the same grades in ten other cities. Not all the problems were used in every city. The number of participants, therefore, varies with different questions. In no case, however, was a problem attempted by less than 5,000 children.

The tests were administered by the class teachers, under instructions. The principal point in the instructions was that the problems were to be written on the blackboard, one at a time, and that ten minutes were to be allowed the pupils for solving each problem.

In rating the papers, children were scored as correct only in case the answer to the problem was correctly given. In a few instances, where the teacher had evidently presented an example incorrectly, and the change did not affect its nature or apparent difficulty, it was scored as correct if the pupils gave the right answer under the changed condition. In the few instances where changes were introduced by the teacher which affected the nature and difficulty of the problem, no record was taken of the results.

The problems listed under Table I were given, in a preliminary test, to children in several cities other than New York City, and in a test of eight schools of a certain type in New York City, on March 23, 1915. In order to distinguish them from the problems shown under Table II, they are called the "March test."

The problems listed under Table II were given, in a preliminary test, to children in a number of cities other than New York City, and were then given, also, to the same eight schools of New York City, on June 24, 1915. For convenience in designation, these problems are called the "June test."

TABLE I

DISTRIBUTION OF CORRECT ANSWERS BY QUESTIONS AND BY GRADES
ARITHMETIC. MARCH TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF			
	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct
1.....	1,526	143	1,798	201	1,296	308	1,304	520	5,924	1,172
2.....	1,526	362	1,788	557	1,296	586	1,304	804	5,924	2,309
3.....	1,525	681	1,635	898	1,177	785	1,261	963	5,598	3,327
4.....	1,527	533	1,636	700	1,177	628	1,260	913	5,600	2,774
5.....	1,527	544	1,636	801	1,177	669	1,260	885	5,600	2,899
6.....	1,594	425	1,577	558	1,198	528	1,248	678	5,617	2,189
7.....	1,594	816	1,577	985	1,198	869	1,248	985	5,617	3,655
8.....	1,594	539	1,604	695	1,214	628	1,248	862	5,660	2,724
9.....	1,594	751	1,604	833	1,214	753	1,248	821	5,660	3,158
10.....	1,594	635	1,604	804	1,214	671	1,248	909	5,660	3,019

The ten problems used in the March test are the following, their numbers corresponding to the numbers in the table above:

1. If a map 10 in. wide and 16 in. long is made on a scale of 50 mi. to the inch, what is the area in square miles that the map represents?

2. Cream is sold in ½-pint bottles. If a milkman buys it at $1.20 a gallon and it costs 40 cents a gallon to bottle and deliver it, at what price per bottle must it be sold to gain 20 per cent?

3. A fruit dealer bought 300 apples at the rate of 5 for a cent, and 300 at 4 for a cent. He sold them all at the rate of 8 for 5 cents. What did he gain on the investment?

4. A family used 1½ bu. of potatoes a month. How much will be saved each month by buying them at $1.30 a bushel instead of at 8 cents a quart? (8 qts. = 1 pk.; 4 pks. = 1 bu.)

5. James buys papers at 10 for 6 cents and sells them at 1 cent each. If his sales average 100 a day for 6 days, what does he add to the family income after keeping $0.10 for himself?

6. The 7A class has 42 on the roll and only 3 absent today; and the 7B class has 48 on the roll with 4 absent. Which has the better percentage of attendance and how much?

7. Bought pencils at $1.20 per gross, and sold them at 1 cent each. Find the gain per cent.

8. A family pays $25 a month for a non-heated flat and uses 5 tons of coal at $7 per ton for heating purposes during the winter. If it moved to a steam-heated flat at $30 a month, would it increase its expenses for the year or not, and how much?

9. The value of the men's factory products in the leading centers of the United States was as follows:

	1860	1900
New York	$17,011,370	$103,220,201
Baltimore	3,124,342	17,290,825
Boston	4,567,749	8,601,431
Chicago	540,709	36,094,310
Philadelphia	9,962,800	18,802,637

Find the increase or decrease in the value of the men's factory products in 1900 as compared with that of 1860.

10. Two boys made a gallon of lemonade, using 16 lemons at 30 cents a doz. and 2 lbs. of sugar at 6 cents a pound. They sold it at 5 cents a glass, 6 glasses to a quart. How much was each boy's share of the gain?

TABLE II

DISTRIBUTION OF CORRECT ANSWERS BY QUESTIONS AND BY GRADES
ARITHMETIC. JUNE TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF			
	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct	No. of Participants	No. Correct
1	1,505	313	1,478	358	1,163	354	1,104	515	5,250	1,540
2	1,442	152	1,454	189	1,091	167	1,166	277	5,153	785
3	1,442	796	1,454	933	1,091	750	1,166	922	5,153	3,401
4	1,508	988	1,544	1,164	1,129	881	1,192	991	5,373	4,024
5	1,442	978	1,499	1,192	1,091	931	1,134	1,046	5,166	4,147
6	1,508	452	1,544	653	1,129	515	1,192	696	5,373	2,316
7	1,526	778	1,754	1,108	1,257	898	1,261	988	5,798	3,772
8	1,442	556	1,454	783	1,091	593	1,124	801	5,111	2,733
9	1,594	481	1,604	616	1,214	572	1,248	785	5,660	2,454
10	1,442	519	1,454	724	1,091	514	1,124	774	5,111	2,531

The ten problems used in the June test are the following, their numbers corresponding to the numbers in the table above:

1. A farmer has a herd of 12 dairy cows that average 22 pounds each of milk per day. The milk contains 3.8 per cent butter-fat, and butter-fat is worth 28 cents per pound. What is the daily income from the herd?

2. I am making a handkerchief out of a piece of linen 10⅛ in. square. If I make a ¼-in. hem all around it, how long and wide will it be when finished?

3. If Texas is 213.06 times as large as Rhode Island, and New York is 39.44 times as large as Rhode Island, then Texas is how many times as large as New York? Express to the nearest second decimal place.

4. According to the report of the Bureau of Census the numbers of persons engaged in the different groups of occupations in the United States in 1880 and 1910 were as follows:

Group	1880	1910
1	7,713,875	12,567,925
2	1,871,503	7,605,730
3	3,784,726	10,807,521
4	603,202	1,825,127
5	3,418,793	5,361,033

Find the total increase in the number of persons employed in the United States in 1910 over those employed in 1880.

5. A can of milk containing 40 quarts costs $1.60. What percentage is gained by selling the milk for 6 cents a quart?

6. I bought a cask of molasses containing 84 gallons for $28. Nine gallons having leaked out, at what price per gallon must I sell the remainder to gain $4.25?

7. A farmer's wife bought 2.75 yards of table linen at $0.87 a yard and 16 yards of flannel at $0.55 a yard. She paid in butter at $0.27 a pound. How many pounds of butter was she obliged to give?

8. A man and boy together spaded $\frac{2}{10}$ of a garden. If the man spaded twice as much as the boy, what part of the garden did each spade?

9. A contractor completed $\frac{1}{3}$ of a job in $12\frac{1}{2}$ days. How much longer should it take to finish the job?

10. In a certain state the cost of building a macadam road is shared by the town, county, and state. The state pays $\frac{1}{2}$, the county $\frac{1}{4}$, and the town the remainder. If the state pays $1,200, what does the town pay?

On the basis of the preliminary testing, the first problem in the March test was supposed to be of equal difficulty with the first problem in the June test; the second problems in both tests were, likewise, supposed to be equal in difficulty; and similarly for the remaining problems. This equality has no particular interest in the present report, and the equality is obscured by the fact that the June test was given at the very end of the school year.

Tables III and IV are based upon Tables I and II, respectively, and show, for each problem and for each grade, the percentages of pupils who obtained correct answers. They also show, as a better expression of the difficulty of the problems, and, consequently, of the ability required for their solution, the equivalents of the percentages, in terms of that unit of variability of the curve of error known as the "Probable Error." It is, of course, a well-known fact that there is an illusion in percentage ratings, due to the fact that the distribution of ability does not take rectangular form, but, rather, that of a logarithmic curve of approximately "normal" type. Account of this distribution is taken when

TABLE III

PERCENTAGES OF CORRECT ANSWERS FOR EACH PROBLEM AND FOR EACH GRADE, WITH P.E. EQUIVALENTS
ARITHMETIC. MARCH TEST

Problem Numbers	Seventh Grade				Eighth Grade				Total	
	First Half		Second Half		First Half		Second Half			
	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median
1...	9.4	+1.95	11.2	+1.80	23.8	+1.06	39.9	+0.38	19.8	+1.26
2...	23.7	+1.06	31.0	+0.74	45.2	+0.18	61.7	−0.44	39.0	+0.41
3...	44.7	+0.20	54.9	−0.18	66.7	−0.64	76.4	−1.07	59.4	−0.35
4...	34.9	+0.58	42.8	+0.27	53.4	−0.13	72.5	−0.89	49.5	+0.02
5...	35.6	+0.55	49.0	+0.04	56.8	−0.25	70.2	−0.79	51.8	−0.07
6...	26.7	+0.92	35.4	+0.56	44.1	+0.22	54.3	−0.16	39.0	+0.41
7...	51.2	−0.04	62.5	−0.47	72.5	−0.89	78.9	−1.19	65.1	−0.58
8...	33.8	+0.62	43.3	+0.25	51.7	−0.06	69.1	−0.74	48.1	+0.07
9...	47.1	+0.11	51.9	−0.07	62.0	−0.45	65.8	−0.60	55.5	−0.21
10...	39.8	+0.38	50.1	−0.00	55.3	−0.20	72.8	−0.90	53.3	−0.12

TABLE IV

PERCENTAGES OF CORRECT ANSWERS FOR EACH PROBLEM AND FOR EACH GRADE, WITH P.E. EQUIVALENTS
ARITHMETIC. JUNE TEST

Problem Numbers	Seventh Grade				Eighth Grade				Total	
	First Half		Second Half		First Half		Second Half			
	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median	Per-centage Correct	P.E. from Median
1...	20.8	+1.21	24.2	+1.04	30.4	+0.76	46.6	+0.13	29.3	+0.81
2...	10.5	+1.86	13.0	+1.67	16.6	+1.44	23.8	+1.06	15.2	+1.52
3...	55.2	−0.19	64.2	−0.54	68.7	−0.72	79.1	−1.20	66.0	−0.61
4...	65.5	−0.59	75.4	−1.02	78.0	−1.15	83.1	−1.42	74.9	−1.00
5...	67.8	−0.69	79.5	−1.22	85.3	−1.56	92.2	−2.10	80.3	−1.26
6...	30.0	+0.78	42.3	+0.29	45.6	+0.16	58.4	−0.32	43.1	+0.26
7...	51.0	−0.04	63.2	−0.50	71.4	−0.84	78.4	−1.17	65.6	−0.60
8...	38.6	+0.43	53.9	−0.15	54.4	−0.16	71.3	−0.83	53.5	−0.13
9...	30.2	+0.77	38.4	+0.44	47.1	+0.11	62.9	−0.49	43.4	+0.25
10...	36.0	+0.53	49.8	+0.01	41.1	+0.33	68.9	−0.73	49.1	+0.03

percentage values are thus converted into some unit of variability of the curve of error.[1]

The twenty problems listed in Tables I–IV, as has been stated, were given in March and in June, 1915, to typical schools in New York City. On the basis of the returns received from these schools, the figures given in Tables V and VI were made up. These figures refer to the scores of individuals. As measures of the ability of groups of children, these tables may prove useful. They are, however, only approximations.

TABLE V

DISTRIBUTION OF PUPILS ACCORDING TO THE NUMBER OF PROBLEMS ANSWERED CORRECTLY

ARITHMETIC. MARCH TEST

No. of Problems Correct	Grade VII[a]		Grade VII[b]		Grade VIII[a]		Grade VIII[b]		Grades VII[a] to VIII[b]	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
0.....	190	13.2	144	8.1	43	3.9	6	0.6	353	7.1
1.....	230	16.0	157	11.1	73	6.7	18	1.7	478	9.6
2.....	160	11.1	147	10.4	88	8.1	42	4.0	437	8.8
3.....	204	14.1	154	10.9	96	8.8	51	4.9	505	10.1
4.....	161	11.2	178	12.6	112	10.3	67	6.4	518	10.4
5.....	156	10.8	147	10.4	132	12.1	115	11.0	550	11.0
6.....	114	7.9	150	10.6	131	12.0	117	11.3	512	10.3
7.....	98	6.8	126	8.9	136	12.5	160	15.4	520	10.4
8.....	77	5.3	121	8.6	125	11.5	163	15.6	486	9.8
9.....	43	3.0	107	7.6	96	8.8	189	18.1	435	8.7
10.....	9	0.6	9	0.6	59	5.4	114	10.9	191	3.8
Total	1,442	.....	1,410	.....	1,091	.....	1,042	.....	4,985	.....
Median...	2.691	.....	4.747	.....	6.015	.....	7.656	.....	5.367	.....

The fact that the ten problems upon which each of these tables is based varied widely in point of difficulty makes conclusions as to individual abilities somewhat unreliable. Tables made up from material each part of which was of equal difficulty would be more reliable, but no such tables have ever been constructed, for the reason that no material meeting these conditions exists. Meanwhile, therefore, we shall be obliged to content ourselves with the usual method of approximation. With this caution

[1] For conversion tables see E. L. Thorndike, *Mental and Social Measurements*, 2d ed., p. 228; also B. R. Buckingham, *Spelling Ability, Its Measurement and Distribution*, p. 116.

in mind, Tables V and VI may be used as standards of attainment. Figs. 1–8 show, in graphic form, the frequencies of each rating as given in these tables.

TABLE VI

DISTRIBUTION OF PUPILS ACCORDING TO THE NUMBER OF PROBLEMS ANSWERED CORRECTLY

ARITHMETIC. JUNE TEST

No. of Problems Correct	Grade VII[1]		Grade VII[2]		Grade VIII[1]		Grade VIII[2]		Grades VII[1] to VIII[2]	
	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage	No.	Per-centage
0.....	67	4.6	28	2.0	13	1.2	4	0.4	112	2.2
1.....	144	10.0	65	4.6	32	2.9	4	0.4	245	4.9
2.....	193	13.4	95	6.7	71	6.5	27	2.6	386	7.7
3.....	235	16.3	165	11.7	111	10.2	62	6.0	573	11.5
4.....	211	14.6	200	14.2	171	15.7	73	7.0	655	13.1
5.....	204	14.1	243	17.2	167	15.3	116	11.1	730	14.6
6.....	143	9.9	204	14.5	146	13.4	145	13.9	638	12.8
7.....	97	6.7	189	13.4	142	13.0	184	17.7	612	12.3
8.....	70	4.9	134	9.5	129	11.8	159	15.3	492	9.9
9.....	54	3.7	69	4.9	79	7.2	189	18.1	391	7.8
10.....	24	1.7	18	1.3	30	2.7	79	7.6	151	3.0
Total.....	1,442	.....	1,410	.....	1,091	.....	1,042	.....	4,985	.....
Median...	4.389	.....	5.626	.....	5.886	.....	7.489	.....	5.715	.....

Fig. 9 shows, for each grade, in the form of a scale, the facts with respect to the difficulty of the problems that were shown in the columns headed "P.E. from Median" in Tables III and IV, although the problems of the June test are not strictly comparable to those of the March test, on the basis of the returns received, for the reason that there is an increment of ability among school children during a three months' period. The two sets of problems are scaled on the same projection, but they are kept separate by showing, in Fig. 9, the numbers of the March problems above the scale line, and the numbers of the June problems below the scale line.

Fig. 9 also shows a general scale for the four grades combined; the point of reference is the median of Grade VII[1]. In order thus to refer the results of the testing in higher grades to the median of the lowest grade, it is necessary to know the intervals between the medians of the successive grades.

Tables VII and VIII show, for the March and June tests, the number of pupils in each grade who equaled or exceeded the score of the median

TABLE VII

AMOUNT AND PERCENTAGE OF OVERLAPPING WITH P.E. EQUIVALENTS
ARITHMETIC. MARCH TEST

		Grade VII^1	Grade VII^2	Grade VIII^1	Grade VIII^2
Grade VII^1	No.	.....	538	340	163
	Per cent	.....	37.3	25.3	11.3
	P.E.	.....	+0.48	+0.99	+1.80
Grade VII^2	No.	1038	.....	511	281
	Per cent	73.6	.....	36.2	19.9
	P.E.	−0.94	.....	+0.52	+1.25
Grade VIII^1	No.	915	708	.....	327
	Per cent	83.9	64.9	.....	30.0
	P.E.	−1.47	−0.57	.....	+0.78
Grade VIII^2	No.	989	875	742	.....
	Per cent	95.0	84.0	71.2	.....
	P.E.	−2.44	−1.48	−0.83	.....

Table reads: 538 pupils of Grade VII^2 equaled or exceeded the score of the median pupil of grade VII^2, which was 37.3 per cent of all pupils of Grade VII^1. The equivalent of this percentage is 0.48 P.E., etc.

TABLE VIII

AMOUNT AND PERCENTAGE OF OVERLAPPING WITH P.E. EQUIVALENTS
ARITHMETIC. JUNE TEST

		Grade VII^1	Grade VII^2	Grade VIII^1	Grade VIII^2
Grade VII^1	No.	.....	465	412	198
	Per cent	.....	32.2	28.6	13.7
	P.E.	.....	+0.69	+0.84	+1.62
Grade VII^2	No.	980	.....	642	318
	Per cent	69.5	.....	45.5	22.6
	P.E.	−0.76	.....	+0.17	+1.12
Grade VIII^1	No.	789	589	.....	311
	Per cent	73.1	54.0	.....	28.5
	P.E.	−0.91	−0.15	.....	+0.84
Grade VIII^2	No.	917	800	770	.....
	Per cent	88.1	76.8	73.9	.....
	P.E.	−1.75	−1.09	−0.95	.....

Table reads: 465 pupils of Grade VII^2 equaled or exceeded the score of the median pupil of Grade VII^2, which was 32.2 per cent of all pupils of Grade VII^1. The equivalent of this percentage is 0.69 P.E., etc.

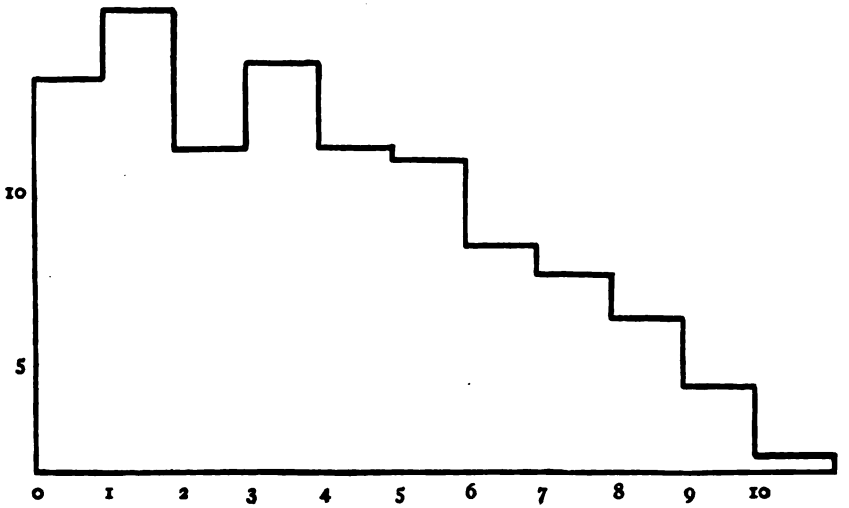

FIG. 1

FIG. 2

FIGS. 1, 2, 3, AND 4.—Frequency of each rating (of problems correct) in Grades for problems answered correctly. The vertical scale is for the percentage of children Grade 7[2]; 1,091 for Grade 8[1]; and 1,042 for Grade 8[2].

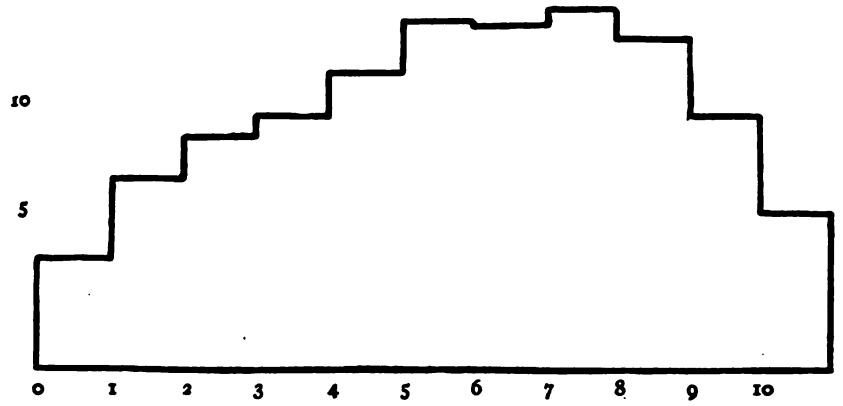

FIG. 3

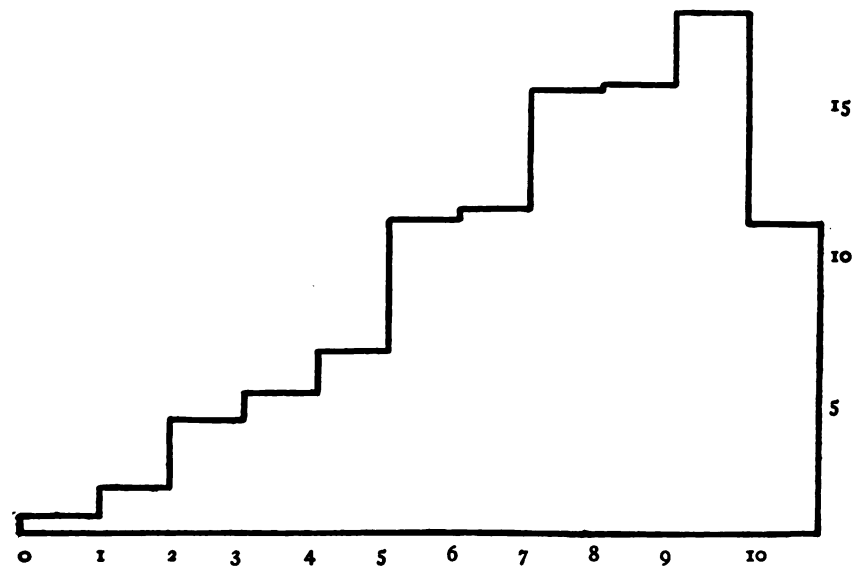

FIG. 4

7^2, 7^3, 8^1, and 8^2, respectively. March test. (See Table V.) The horizontal scale is who obtained each correct number of answers. N = 1,442 for Grade 7^1; 1,410 for

pupil of each of the other grades. They also show the percentages and P.E. values corresponding to these numbers. The P.E. values are the intervals between the grade medians. These tables are constructed upon the assumption of a normal distribution of ability in all grades, and upon the further assumption that the variability in any one grade is equal to the variability in each of the other grades.

Obviously, we have several expressions for the same relationship; for instance, in Table VIII, the distance between the median of Grade VII^1 and the median of Grade VII^2 is (column 4) 0.69. In the same table, the same distance measured in the opposite direction is 0.76. Two similar values for the same distance are shown in Table VII; and besides these four measures, a number of others may be derived. Using, however, only direct statements of the relationship between consecutive medians, we have, in each case, four quantities. The averages of these, being taken, give the following results:

Median of Grade VII^1 to median of Grade VII^2 = 0.72 P.E.
" " " VII^2 " " " " VIII^1 = 0.37 P.E.
" " " VIII^1 " " " " VIII^2 = 0.85 P.E.

To obtain the general scale shown in Fig. 9, all that is necessary to do now is to add to the P.E. values of Tables III and IV, for grades higher than VII^1, the interval at which the medians of these grades stand above the median of Grade VII^1. By so doing, three values in addition to the one for Grade VII^1 will be found, and the average of these four may be taken as the best position at which to "place" the problem in question.

Table IX gives the distance at which each problem stands above the median of Grade VII^1 when computed on the basis just described. The general scale in Fig. 9 is the graphic representation of this table.

It is clear that the scales derived in this paper are very meager, and, as was said in the beginning, this report is merely preliminary and suggestive. A far greater number of problems in arithmetic should be used for the purpose of constructing a more complete scale. In fact, 120 such problems are now being worked up with this end in view. Material is likewise in hand for a large number of questions in geography, history, and grammar, which will be scaled in the same way.

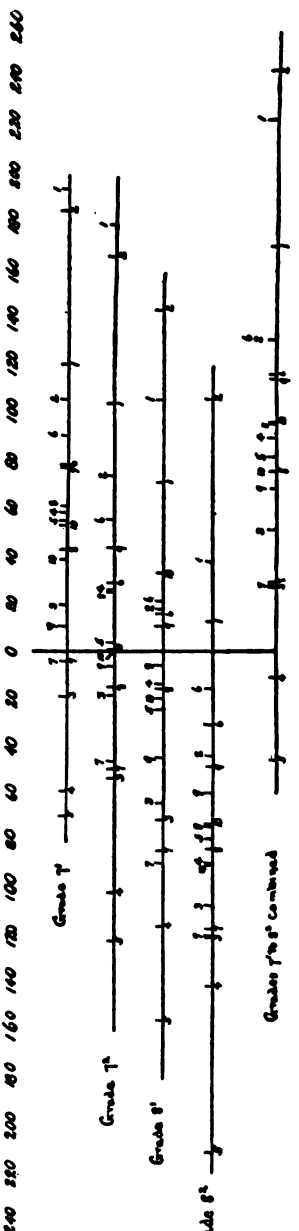

FIG. 9

FIG. 9.—Grade and General Scales. Figures above the scale lines refer to the March Test, those below the scale lines to the June Test.

Any superintendents or principals who are willing to give tests in these subjects are invited to communicate with the writer of this chapter.

TABLE IX

AVERAGE POSITION OF PROBLEMS, EXPRESSED AS DISTANCES FROM THE MEDIAN OF GRADE VII AND IN UNITS OF P.E.

Problem	March	June
1	2.24	1.72
2	1.32	2.45
3	0.52	0.28
4	0.90	−0.11
5	0.83	−0.46
6	1.32	1.17
7	0.29	0.30
8	0.96	0.76
9	0.69	1.15
10	0.76	0.97

CHAPTER III

SCORE CARD FOR CITY SCHOOL BUILDINGS

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The score card which is printed herewith has been developed as a part of the advanced work in educational administration under the direction of the author of this article, with five different groups of graduate students, through two academic years and one summer session.[1] The idea of a score card has been common over a considerable period of years, especially in the work of agricultural colleges. There is a manifest advantage in the score card in that it fixes attention upon all of those qualities or elements which go to make up the perfect whole desired. Individuals in judging school buildings not infrequently think mainly in terms of two or three elements which seem to them to be of primary importance, and often neglect other parts of the building which are, when one stops to consider them, of equal value. In making the score card, it has been necessary first of all to include as nearly as possible all those details which go to make up the perfect school building. It was, of course, desirable, in so far as it was possible, to include under a few main heads all the subordinate factors. It was only after a very considerable amount of experimentation that the heads "Site," "Building," "Service Systems," "Classrooms," and "Special Rooms" were decided upon.

After organizing the score card in terms of the large and the subordinate heads, the next step was, of course, to assign to each main and each subordinate head the proper weight out of a total of a thousand points which was allowed as a perfect score. The method employed was

[1] Special acknowledgment is due to Messrs. L. H. King, B. W. Loomis, and A. Dushkin, who were constituted as the first committee to draft a score card for school buildings, and whose work was used as a basis for discussion in the subsequent development of the form which is here printed. The author is indebted to Dr. M. R. Trabue for the statistical calculations necessary to determine the weights to be assigned to each of the several items.

to ask experienced superintendents and principals of schools taking work in educational administration, which involved a considerable knowledge of statistics, to assign to each element the weight which they thought should be attached. The five large heads were scored first, next the several main subdivisions under each large head, and finally the elements under the last-named divisions. More than two hundred students participated in this part of the work. From the ratings assigned by the last group of a hundred students working upon the score card, after studying the results which had already been secured by the former groups, medians were calculated, first, for the large heads, and then for each of the subordinate heads. The medians were calculated only to the nearest five points on the scale. This means that the score card as it appears represents the combined judgment of the scorers to within two and one-half points. In many cases, of course, the median fell on five or some multiple of five, in which case the score given corresponds exactly to the median found.

The method employed in determining the weight to be assigned to each element appearing on the score card needs no particular defense, since the value of any particular part or element in the construction of the building is, after all, a matter of judgment. The median judgment derived from the scores allowed by a large group of those competent to judge of the worth of the several elements is the best single measure which can be found.

In order to use the score card, one should be familiar with the problems involved in schoolhouse construction. To that end, there appears at the end of the score card a bibliography. It would be well, in training people to use the score card, to have them thoroughly conversant especially with the more important authorities on the subject of school hygiene and school architecture. After such study, visits to buildings, under the guidance of some competent student of these problems, would add greatly in training persons to use the card. The card is given first in a very brief and highly condensed form, which could be used only by those entirely familiar with the longer form and with the meaning of each of the headings which is there listed. As a matter of practice, it will be best first to use the longer form of the score card, and, only, after considerable facility has been acquired, to drop the longer form in favor of the shorter summary. For one familiar with school buildings and with the score card, much would be gained by checking over blueprints

and specifications in the light of the score card before beginning to construct the building. Here again the value is in large measure to be found in the fact that each of the more important items will be brought to the attention of the one who seeks to criticize the plans and specifications, and their relative importance will at least in some measure be indicated.

It will be found particularly worth while to score old buildings, in order to call attention to the necessity for reconstruction which is always to be found in a city in which buildings have been in use over a considerable number of years. As one studies the problem of school buildings in the United States, he is impressed by the accidental or occasional repair or reconstruction which is provided. A careful study and scoring of these buildings will often indicate common deficiencies of very great importance which should receive immediate attention, and others which are of relatively less significance which may be postponed for a time. In the same school system it may be found as well that one building is so remarkably more deficient than another that it is manifestly good public policy to spend whatever money is available in reconstructing the buildings which scores lowest before undertaking the work which may not be nearly as important in other buildings.

In the case of scoring school buildings, as with any other instrument of measurement, the result should suggest problems, and in some measure indicate the direction in which reforms are to be brought about. Any person using the score card should supplement the mere scoring of the several items with a report upon any notable deficiency which renders the building unfit for use. It is entirely conceivable that a building on most counts might stand high, but in some one particular, say with respect to fire protection or sanitation, might rate as entirely unsatisfactory. In this case the notation, after the building was scored, would call attention to the fact that measures should be taken immediately to remedy particular defects, in which case the building would, possibly with a minimum of expense, be brought up to a very high standard of excellency.

The writer will be very glad to receive, from anyone who may use the score card, criticisms or suggestions for its improvement. It will be particularly helpful to receive reports of the use of the score card, showing to what degree two or more individuals scoring the same building arrive at the same result.

SCORE CARD FOR SCHOOL BUILDINGS AND EQUIPMENT FOR CITY ELEMENTARY AND HIGH SCHOOLS

City..... Building.....
Principal..... Date.....
Enrolment: Boys..... Girls..... Total.....
Average Daily Attendance: Boys.....Girls..... Total.....
Number of Rooms..... Approximate Cost.....
Scorer.....

Instructions

1. Abbreviation: S—standard.
2. Basis for scoring—1,000 points.
3. In scoring classrooms, stairways, entrances, fire escapes, and the like, score each separately and insert the average for the final score.
4. It will be worth while to use this card in checking up blueprints of prospective buildings. To do this will require a complete set of specifications with the blueprints, also a copy of state laws and city ordinances.

SHORT FORM OF SCORE CARD

I. Site..... (125)
- A. Location..... (55)
  - 1. Accessibility (25) 2. Environment (30)
- B. Drainage..... (30)
  - 1. Elevation (20) 2. Nature of Soil (10)
- C. Size and Form..... (40)

II. Building..... (165)
- A. Location..... (25)
  - 1. Orientation (15) 2. Position on Site (10)
- B. External Structure..... (60)
  - 1. Type (5) 2. Material (10) 3. Height (5)
  - 4. Roof (5) 5. Entrances (10)
  - 6. Aesthetic Balance (10) 7. Condition (15)
- C. Internal Structure..... (80)
  - 1. Stairways (35) 2. Corridors (25) 3. Basement (15)
  - 4. Attic (5)

III. Service Systems..... (280)
- A. Heating and Ventilation System..... (70)
  - 1. Kind (20) 2. Installation (10) 3. Air Supply (25)
  - 4. Distribution (15)
- B. Fire Protection System..... (65)
  - 1. Apparatus (10) 2. Fireproofness (20) 3. Escapes (20)
  - 4. Electric Wiring (5) 5. Fire Doors (10)

C. Cleaning System ..... (20)
D. Artificial Lighting System ..... (20)
E. Electric Service Systems ..... (15)
1. Clock (5) 2. Bell (5) 3. Telephone (5)
F. Water Supply System ..... (30)
G. Toilet System ..... (50)
1. Distribution (10) 2. Fixtures (10) 3. Adequacy (10)
4. Seclusion (5) 5. Sanitation (15)
H. Mechanical Service Systems ..... (10)
1. Elevators (5) 2. Book-Lifts (2) 3. Waste-Chutes (3)

IV. CLASSROOMS ..... (290)
A. Location and Connections ..... (35)
B. Construction and Finish ..... (90)
1. Size (25) 2. Shape (15) 3. Floors (10)
4. Walls (10) 5. Doors (5) 6. Closets (5)
7. Blackboards (10) 8. Color-Scheme (10)
C. Illumination ..... (85)
1. Glass Area (45) 2. Windows (30) 3. Shades (10)
D. Cloakrooms and Wardrobes ..... (25)
E. Equipment ..... (55)
1. Seats and Desks (40) 2. Teacher's Desk (10)
3. Bulletin Boards (5)

V. SPECIAL ROOMS ..... (140)
A. Large Rooms for General Use ..... (65)
1. Playroom (10) 2. Auditorium (15) 3. Study-Hall (5)
4. Library (10) 5. Gymnasium (15) 6. Lunchroom (10)
B. Rooms for School Officials ..... (35)
1. Offices (10) 2. Teachers' Room (10) 3. Nurses' Room (10)
4. Janitor's Room (5)
C. Other Special-Service Rooms ..... (40)
1. Laboratories (20) 2. Lecture-Rooms (10) 3. Storerooms (5)
4. Studios (5)

DETAILED SCORE CARD FOR CITY SCHOOL BUILDINGS

I. SITE

A. *Location:*
1. Accessibility—centrality (present and future), car lines, streets.
2. Environment:
a) Physical—gardens, trees, shrubbery, buildings, hills.
(S—Skyline should not have an angle of more than 30 degrees from base of building.)
b) Social—density of settlement, composition, moral influences.
c) Protection—freedom from noise, dust, danger, malodors.

B. *Drainage:*

1. Elevation, slope. (S—Grounds should slope away from building and should not exceed 1 in. for every 3 ft.)
2. Nature of soil—residual or artificial, kind, texture, aeration, hydration, surface material.

C. *Size and Form:*

Should be large enough and of good shape to allow for proper placing of buildings, for 30 sq. ft. of playground per child, and for school garden.

II. Building

A. *Location:*

1. Orientation—light, exposure. (S—Southeast, east, southwest, west, and south in order.)
2. Position on site as regards appearance and economy of playgrounds.

B. *External Structure:*

1. Type—rectangle, square, inner court, T, H, E, U.
2. Material. (S—Brick or stone.)
3. Height—number of stories. (S—Two stories above basement.)
4. Roof—type and material. (S—Flat, waterproof, suitable for playground, proper slope for drainage.)
5. Entrances:
   a) Number, location width. (S—At least two, near stair landings, 11–13 ft. wide.)
   b) Steps—number, protection from the elements. (S—As few as possible, unexposed.)
   c) Vestibules—size, lighting. (S—11–13 ft. wide, double-swing glass doors, and waterproof floors.)
   d) Doors—kind, opening, springs, checks, stops. (S—3½ ft.×8 ft., opening outward with panic bolts.)
6. Aesthetic balance. (S—Simplicity and utility.)
7. Condition. (S—Should be in good repair.)

C. *Internal Structure:*

1. Stairways.
   a) Construction—kind (box, open, winding), material, tread and riser, nosing, width, landing, banister (number, kind, size, stability), soundproofness. (S—Tread, 11–13 in.; riser, 7 in.; width, 5 ft.; metal banister, 1¼ in. dia., at least two for each stairway, firmly attached.)
   b) Number and location—proximity to exits. (S—At least two, landings near exits.)
   c) Lighting—natural and artificial. (S—Should be well lighted.)
   d) Sanitation—coves, corners, ledges. (S—Should have sanitary coves and be free from dust-catchers.)

2. Corridors.
   a) Location.
   b) Construction—material, width, door arrangement, finish (chair rail, picture mold, dado). (S—Width 11–13 ft.)
   c) Obstructions—lockers, cases, pedestals. (S—These should not obstruct easy passage.)
3. Basement.
   a) Depth below grade, dampness, areas. (S—Depth, 3 ft.; floor and walls waterproof.)
   b) Boiler-room, accessibility to fuel-room, exits, ash-lifts.
   c) Fuel-room, size, construction, chute.
4. Attic, waterproof, heatproof, floor.

III. Service Systems

Note.—Defects in any service system should be checked against the system, wherever found.

A. *Heating and Ventilating System:*
   1. Kind of system—direct, direct-indirect, gravity, plenum, plenum-exhaust.
   2. Installation—piping, workmanship, noise, control. (S—All piping should be insulated.)
   3. Air supply—source, amount, humidification, ducts. (S—From the top of the building; humidity 40–60 per cent; 2,000 cu. ft. per hour per pupil, should not enter with a velocity greater than 6 ft. per second.)
   4. Distribution—size, arrangement, kind of ducts, pipes, and radiators. (S—Single ducts for each room; inlets 8–9 ft. above floor, outlets near floor.)

B. *Fire Protection System:*
   1. Apparatus—fire hose, extinguishers, water pressure, fire alarms. (S—Adequate supply on each floor; fire alarms easily accessible, automatic in boiler-room, connected with city fire department.)
   2. Fireproofness:
      a) Building as a whole—rating of underwriters.
      b) Stairways. (S—Encased fireproof stair-wells.)
      c) Boiler- and fuel-rooms. (S—Separate fireproof rooms.)
   3. Fire escapes—number, location, kind, protection, number of exits. (S—In non-fireproof buildings there should be at least two fire escapes.)
   4. Electrical work—nature and place of intake, insulation, number and kind of outlets, location of switches, meter, cut-out, cabinets. (S—Should be installed according to rules of underwriters.)
   5. Fire doors—kind, location, operation. (S—Automatically closing.)

C. *Cleaning System:* Kind, installation, efficiency. (S—Vacuum system.)

D. *Artificial Lighting System:* Kind, amount, distribution, number, and location of switches, outlets for lanterns, etc.

E. *Electric Service Systems:*
1. Clocks.
2. Bells and gongs.
3. Telephones—number and location. (S—At least one on each floor.)

F. *Water Supply System:* Drinking-fountains, baths, lavatories, janitor's supply (on each floor). Installation and sanitation.

G. *Toilet System:*
1. Distribution—location, accessibility. (S—Most on first floor, others distributed.)
2. Fixtures—seats, urinals, washbowls, sinks, towel and paper holders—size, kind, durability, and arrangement.
3. Adequacy—number. (S—1 seat for each 15 girls, 1 seat for each 25 boys, 1 urinal stall for each 10 boys.)
4. Seclusion—soundproofness, doors.
5. Sanitation—finish, material, workmanship, lighting, ventilating. (S—Material—not absorbent, non-corrosive.)

H. *Mechanical Service Systems:*
1. Elevators (for buildings of more than four stories)—location, fireproofness, adequacy.
2. Book-lifts.
3. Waste-chutes—kind, location, size. (S—Fireproof, outlets closing automatically.)

IV. Classrooms

A. *Location and Connections* (to exit, drinking-fountains, toilet). Deduct for baserooms and those above fourth floor without elevators.

B. *Construction and Finish:*
1. Size. (S—Per pupil 15 sq. ft. floor space and 200 cu. ft. air space.)
2. Shape—classroom 24×30×12 ft.
3. Floors—material, condition (cracks, checks, splinters, loose boards, projecting ends), width of boards, soundproofness, cove, baseboard, surface, finish. Stone, tile, cement, and other composition floors are bad for class- or study-rooms. (S—Should be battleship-linoleum, or hard wood, durable, well joined, and not dust-retaining.)
4. Walls, ceiling—plastering, finish, texture, condition, picture mold, chair rail, kind and condition of dado. (S—Hard, smooth, non-glass plaster, with cement plaster for dado, avoiding grooves and ledges.)
5. Doors—how opened, size, kind, lock, threshold, transom, number of exits. (S—Doors without thresholds and transoms.)
6. Closets and bookcases—location, size, convenience.
7. Blackboards—kind, length, width, color, chalk rail, height from floor, surface, quality, condition, trim. (S—Slate, full black, on front and side of room, 36–42 in. wide, height of chalk rail, grades I–II, 24 in.; III–IV, 26 in.; V–VI, 28 in.; VII–VIII, 30 in.; high school, 32–36 in.)

8. Color-scheme—woodwork, dado, walls, ceiling, furniture, shades, finish, fixtures. (S—Neutral color, buff or green; dado slightly darker than walls, white or cream ceiling; woodwork, furniture, and shades to harmonize in tone; dull, smooth finish.)

C. *Illumination:*
1. Glass area—$\frac{1}{5}$ to $\frac{1}{4}$ area of floor.
2. Windows—size of mullions, nearness to ceiling, height of sill, kind of glass, distance of front window from front wall, orientation, shape. (S—From pupils' left, unilateral, grouped, symmetrical, as near ceiling as possible, $3\frac{1}{2}$ to 4 ft. from floor, plain glass, mullions not over 12 in. wide. Front windows should not come within 5 ft. of front wall; easterly exposure best; rectangular in shape.)
3. Shades—kind, material, hanging, adjustment, condition. (S—Adjustable from center.)

D. *Cloakroom, Wardrobes:* Location, size, convenience, ventilation, finish. (S—Ample ventilation and accommodation.)

E. *Equipment:*
1. Seats and desks—kind, number. (S—Adjustable-movable or adjustable; not over 42 in number.)
2. Teacher's desk. (S—No platform.)
3. Bulletin boards.

V. Special Rooms

A. *Large Room for General Use:*
1. Playroom—location, size, accessibility, adaptability, finish. (S—Per pupil 15 sq. ft. floor space and 200 cu. ft. of air space.)
2. Auditorium:
   a) Location, accessibility. (S—Should be on first floor.)
   b) Construction—size, height, seating capacity, floor, acoustics, exits, obstructions, gallery (kind, seating capacity, location), light and nature of stage, finish, ornamentation. (S—For 80 ft. length on flat floor, stage should be 3 ft. 8 in. high; on dish floor, 3 ft.)
   c) Auxiliaries—dressing-rooms, curtain, setting, seats (kind, arrangement).
3. Study-hall—location, size, accessibility (especially to library), adaptability, finish.
4. Library—location, size, accessibility, form and arrangement of stacks.
5. Gymnasium:
   a) Location—accessibility, segregation of sexes.
   b) Construction—size, floor, track, gallery, soundproofness, finish. (S—Height 22–25 ft. Length and width should relate as 3 to 2.)
   c) Auxiliaries—lockers, showers, dressing-rooms (number, kind, location, convenience, condition.)
6. Lunchroom—location, accessibility, size, adaptability, arrangement, finish, sanitation.

B. *Rooms for School Officials:*
   1. Offices—location, size, adaptability, finish; waiting-room (ditto).
   2. Teachers' room—location, size, toilet facilities, equipment, finish. (S—Equipped with chairs, couch, gas or electric plate.)
   3. Nurses' room—location, size, equipment and toilet facilities (including bath) adaptability, sanitation, finish.
   4. Janitor's room—location, size, convenience.

C. *Other Special-Service Rooms:*
   1. Laboratories:
      NOTE.—Include all facilities for chemistry, physics, biology, physiography, commercial work, household and industrial arts.
      a) Kind, location, size, adaptability. (S—Depends on number of pupils to be accommodated. A room 30×40 ft. will accommodate 25 pupils.)
      b) Construction—plumbing, storerooms, cabinets, finish.
   2. Lecture-room—location, size, seating capacity, plumbing facilities, accessibility, fixed furniture (number, kind, arrangement).
   3. Supply- and storerooms—location, size, adaptability.
   4. Studios—kind, location, size, and adaptability.
      NOTE.—Include drawing-, art,- and music-rooms.

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CHAPTER IV

COMPLETION TESTS FOR PUBLIC-SCHOOL USE

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Many of the tests upon which psychologists depend for their knowledge of an individual's mental characteristics are of such a nature that it is almost impossible to make extended use of them in the schoolroom. There are other very reliable psychological tests, however, which may be adapted to schoolroom use with comparatively few changes. One of these is the completion test, which psychologists have come to regard as an unusually good test of ability to think about words and language forms. In view of the fact that so much of the child's school work is dependent upon his ability to read and interpret printed words, it has seemed worth while to the writer to make such changes in the form of the completion test as will make it available for general use in schools.[1]

The scale shown below will serve as an example of the proposed new completion-test forms. It is believed that these new forms will be found very helpful to school officers in measuring the abilities of children and in classifying them accordingly.

The foregoing form is designed to meet the two or three most serious obstacles which heretofore have confronted the school officer who wished to employ the completion test in his school system. In the first place, the forms commonly used by the psychologists cannot be employed in the middle and lower grades of the elementary school because they are too difficult. Ebbinghaus, who was the first to employ the completion-test method, used mutilated paragraphs. In this respect he has been followed very closely by later investigators, and in almost every instance the incomplete paragraphs have been too difficult for practical use with elementary school pupils. I have attempted, in preparing forms for school children, to use the sentence, rather than the paragraph,

[1] M. R. Trabue, "Completion-Test Language Scales," *Teachers College Contributions to Education*, No. 77, New York, 1915.

as the unit of thought. I have found it possible to begin a test with sentences so simple that a large majority of the second-grade pupils are able to complete them correctly, and to finish the test with sentences so difficult that only a small percentage of the Freshmen in college complete them.

Write only one word on each blank
Time Limit: Seven minutes

Name..... .....

TRABUE LANGUAGE SCALE B

1. We like good boys ..... girls.
6. The ..... is barking at the cat.
8. The stars and the ..... will shine tonight.
22. Time ..... often more valuable ..... money.
23. The poor baby ..... as if it were ..... sick.
31. She ..... if she will.
35. Brothers and sisters ..... always ..... to help ..... other and should ..... quarrel.
38. ..... weather usually ..... a good effect ..... one's spirits.
48. It is very annoying to .... tooth-ache, ... often comes at the most ..... time imaginable.
54. To ..... friends is always ..... the ..... it takes.

A second difficulty with previous completion-test forms arises from the fact that we do not know the relative values of the various commonly used paragraphs, which makes it practically impossible to measure progress from year to year or from grade to grade. Professor Whipple emphasizes this point, as follows: "Since the elision of a single letter may, in some circumstances, very considerably increase the difficulty of the test, it follows that, without extensive preliminary trials, it is well-nigh impossible to prepare a series of texts of equivalent difficulty, or to insure that the several sections within a given text present equivalent difficulty."[1]

This objection has been met by actually trying the incomplete sentences upon thousands of public-school children and discovering from the results just how difficult each sentence is for each class of children, and for all children together. From the results thus obtained,

[1] G. M. Whipple, *Manual of Mental and Physical Tests*, Part II (1915), p. 284.

four approximately equal scales have been derived (Scale B, shown above, being one of the four), each scale consisting of ten sentences, which are arranged in the order of their difficulty from simple to hard. By measuring ability at the beginning of a year with one scale and then at the beginning of the next year with an equivalent scale, it is possible by subtracting the first result from the second to determine the amount of change effected in a class or in a child during a year.

A third difficulty with the paragraph form of the completion test is found in the scoring. Ebbinghaus scored according to the number of syllables correctly supplied, but this method is inadequate, for some syllables are ten times as hard to supply as others. Later investigators have estimated the quality of the completed paragraphs as wholes, giving 100 per cent for a perfectly completed paragraph, 50 per cent "if the inserted words make a well-connected story, but related in only a moderate degree to the thought that should have been given," and no credit at all for words which are "purely literary invention, having no connection with the thought given by the printed words."

It will readily be seen that very careful consideration and judgment are required if one is to assign accurate and comparable scores in the foregoing manner. Even trained psychologists have difficulty in agreeing just how much a given completion is worth. Teachers and school administrators are usually too busy with other school problems to spend much time in such tiresome mental labor as is required to assign scores to partially completed paragraphs.

After making an attempt to distinguish six grades of quality (5–4–3–2–1–0) in the completion of a sentence,[1] the writer found that practically nothing was lost by simplifying the scoring still further, giving 2 points credit for each perfectly completed sentence, 1 point for each sentence completed with only a slight imperfection, and 0 for any sentence omitted or imperfectly completed. It is infinitely easier and quicker to say that a sentence is "right," or that it is almost "right," than it is to decide that a partially completed paragraph is worth 78 per cent of a perfectly completed paragraph. The writer has also published in the appendix of his report the detailed scheme by which each individual sentence was scored, in order that teachers or administrators who do not wish to be

[1] J. L. Stenquist, E. L. Thorndike, and M. R. Trabue, "The Intellectual Status of Children Who Are Public Charges," *Archives of Psychology*, No. 33, September, 1915, pp. 13–19.

bothered with the making of judgments as to whether a sentence is right or wrong may have before them very objectively just what has been called "right" and what has been called "wrong."

The writer is rather firmly convinced that ability to perform mental tasks can be measured more adequately by a graded series of performances to be done in a given time than by any other scheme. The measurement of physical ability to lift weights at arm's length may be taken as an analogy. If we had a series of ten weights, ranging from 20 to 200 pounds by steps of 20 pounds between consecutive weights, as represented in Fig. 1, we might measure a boy's ability by having him begin at the lightest of the series and at arm's length lift in their order to the level of his shoulder as many of the weights as possible. In order to make the analogy with Scale B complete, we should have to give 2

FIG. 1.—Representing a series of graduated weights.

points credit for each weight lifted to a level with his shoulders, and 1 point for each weight which was lifted "almost but not quite" to the shoulder level within a time-limit of seven minutes.

With the older completion-test forms the analogous measurement would be as follows: give the individual the 200-pound weight and see how nearly to the shoulder level he can raise it in ten minutes. It is clear at once that a test arranged on such a plan could be used for only a short fraction of the total range of ability, and that scores assigned by different individuals for the same quality of performance would vary considerably.

With certain commonly used tests in arithmetic the analogous measurement would be somewhat as follows: give the boy a large number of 100-pound weights and see how many of them he can at arm's length lift to shoulder level in four minutes. It is evident at once that a large amount of ability must be present before such a test can begin to measure, and that speed is practically the only element of ability measured. Since speed is desirable, however, it is highly worth while to measure it, although we must be careful not to take a measurement of speed as a sufficient index of ability.

In arranging the language scales, the writer has assumed that older children will not only be able to do the same tasks more rapidly and more perfectly than younger children, but that the older children will also be able to accomplish perfectly tasks which the younger children could not begin to do. The results from twelve or thirteen thousand children, upon whom these sentences have been tried, seem to support this assumption in every respect.

The unit of difficulty used in constructing Language Scales B, C, D, and E is the P.E., or median deviation from the median of a school-grade distribution of ability, assuming the curve of distribution for ability in any given grade to be "normal" in shape and equivalent in range to the range of any other grade distribution. The reasons for making these assumptions and using this measure of the variability of a

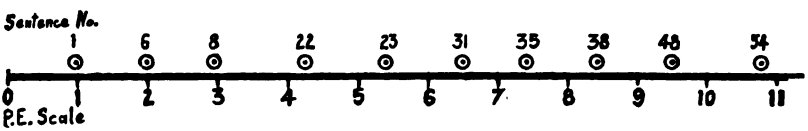

FIG. 2.—Linear projection of Language Scale B.

grade as the unit need not be discussed here. It is worth while to remember, however, that if we take any two groups, selected by the same or by equally capable judges as representing two different degrees of the same sort of ability, these two groups are very likely to be distributed "normally" in each case and the variability of one group will probably be very nearly equal to the variability of the other. In other words, approximately as many errors of judgment are made in selecting one group as in selecting the other, and in each group approximately as many are overestimated as are underestimated, errors in either direction being much more frequently small than large. In brief, the P.E. is a convenient unit which has approximately the same value in every grade and may therefore be used to measure the distance between grades and the difficulty of tests for all grades.

On a P.E. scale above an arbitrary zero point, the location of each sentence of Language Scale B is as represented in Fig. 2. It will be observed that the intervals between sentences are not exactly 1 P.E. in each case, but for practical purposes they are near enough. The improvement made by a person who was at first able to complete only two sentences but is now able to complete four is at least in a very real sense

equal to the improvement made by the person who was at first able to complete only seven sentences but is now able to complete nine.

As yet the writer has not had time to use the new scales very extensively in their present form, although the sentences of which they are composed have been thoroughly tested in other combinations of sentences. Language Scale A,[1] which is so poorly graded as not to be worthy of the name "scale," has nevertheless revealed some of the possible values of the completion test in school procedure.

Scale A was composed of 24 sentences, so that with 2 points credit for each perfectly completed sentence the maximum score possible would be 48 points. The median score and the range of the middle 50 per cent of the scores are shown in Table I for those pupils of the elementary grades who were tested with Scale A.

TABLE I

SCORES OF ELEMENTARY-GRADE PUPILS ON LANGUAGE SCALE A

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
No. tested.....	1318	1437	1463	1507	1454	1456	1427
Median score....	4.59	8.99	14.33	18.39	21.92	25.27	28.06
25 percentile....	2.40	6.22	10.28	14.97	18.14	21.58	24.34
75 percentile....	6.57	13.04	18.60	22.02	25.36	29.08	32.42

In connection with Table I it is worth while to consider Table II, which shows the median scores of twelve-year-old boys according to the school grade in which they are found.

TABLE II

MEDIAN SCORES OF TWELVE-YEAR-OLD BOYS ON LANGUAGE SCALE A

	SCHOOL GRADE					
	III	IV	V	VI	VII	VIII
No. tested.....	22	62	155	269	217	76
Median score.....	10.5	12.9	16.3	21.6	24.7	29.8

[1] M. R. Trabue, "Some Results of a Graded Series of Completion Tests," *School and Society* (April 10, 1915), 537–40.

It would seem from Tables I and II that the ability measured by these completion-test sentences is related rather closely to the ability which teachers consider when promoting pupils to higher grades. Table III, showing the median scores of sixth-grade boys according to their

TABLE III

MEDIAN SCORES OF SIXTH-GRADE BOYS ON LANGUAGE SCALE A

	AGE						
	10	11	12	13	14	15	16
No. tested	70	201	243	164	74	30	7
Median score	23.4	22.6	21.9	21.1	18.9	17.6	13.3

ages, is interesting in this connection. This table furnishes evidence of a fact which needs to be emphasized. Teachers tend to retard the bright young chaps because they are "too young" and to promote the dull old fellows because they are "too old" for the grade. Possibly the most serious retardation problems in our American school systems arise from our lack of adequate provision for the exceptionally bright young children.

Scale A was given in a number of intermediate schools with interesting results. At Decatur, Illinois, four classes of Grade VIIA were tested. The median scores were as follows:

	CLASS			
	VIIA[1]	VIIA[2]	VIIA[3]	VIIA[4]
No. pupils	23	22	20	21
Median	28.3	26.9	25.5	23.7

After this result was noticed, I was interested to find that each pupil is classified, on entering VIIA, according to the judgment of previous teachers as to his general ability to do school work, those of greatest ability being put in VIIA[1], the next best group in VIIA[2], and so on.

In Grand Rapids, Michigan, those pupils in the eighth grade whose superior scholarship has been proved are allowed to take up the study of Latin. The median score of the 28 pupils in the Latin group was 34.0, with only one score as low as 27, while the median score of the 71 other

pupils in the same grade of that school was 29.8, with two scores of 17. Evidently the ability required to make high scores on Language Scale A is rather closely related to the quality for which teachers look when they attempt to select their brightest pupils for special work.

In view of the fact that ability to complete incomplete sentences is so obviously dependent upon ability to read and interpret printed words, it is not surprising to find that home training and nationality show an appreciable correlation with ability in these language scales. Three graduating classes in the elementary schools of Kansas City were measured on Language Scale A, with the following results:

	School		
	Hyde Park	Whittier	Hamilton
No. pupils	44	42	29
Median	33.4	31.3	27.3

The Hyde Park and Whittier schools are distinctly American, the first being in the best residence section of the city and the second being in a respectable middle-class district. The Hamilton School, however, is in a foreign district, one block from the Swope Settlement.

The writer found a similar situation in Bayonne, New Jersey. Three VIA classes were measured on Scale A, with the following results:

	School		
	Mann	Vroom	Lincoln
No. pupils	32	37	39
Median	23.6	20.4	19.2

The Mann School is largely American, the Vroom largely Jewish, and the Lincoln largely Slavonic in student population.

The completion test is not proposed as a substitute for the judgment of teachers in promoting pupils, but rather as an aid to it. Employing one of these scales will call attention to those children who have unusual ability to understand and interpret printed words and phrases. These unusual cases may then be investigated more carefully and such readjustments made as will allow these children to work under the most favorable conditions.

PART II

APPLICATION OF SCALES AND UNITS OF MEASUREMENT IN EDUCATIONAL SUPERVISION AND ADMINISTRATION

CHAPTER V

WORK OF THE DEPARTMENT OF EDUCATIONAL INVESTIGATION AND MEASUREMENT, BOSTON, MASSACHUSETTS

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The three phases of the work of the Department of Educational Investigation and Measurement, which will be described in order below, are: (A) measurement of educational results; (B) supervision of a revision of the elementary course of study; (C) the organization of a plan for the promotion of teachers on merit.

A. MEASUREMENT OF EDUCATIONAL RESULTS

I. *Arithmetic.*—The Courtis standard research tests in the four fundamentals were first given in Boston in October, 1912, by Mr. Courtis himself. Later they were given by others and have been continued to be given by this department. Their introduction into the Boston schools has been gradual, beginning with 21 districts in October, 1912, and covering the 70 elementary districts in May, 1915.

The tests have resulted as follows:

1. They have made possible the establishment of objective standards of achievement for Grades IV–VIII in addition, subtraction, multiplication, and division. These standards are based on the median score attained by large groups of pupils, and represent, therefore, the minimal achievement of at least 50 per cent of the children tested. These standards are shown in Table I.

2. These tests have shown the relative standing of each school, of each class, and of each pupil, in the 70 elementary school districts

tested, thereby providing the administrative officers with information as to the conditions which need improving.

3. They have revealed the ineffectiveness of the present general class drill in arithmetic on the four fundamentals, by showing that approximately one-third of the class gets more drill than it needs, another third makes fair progress, and the other third not only does not improve but, in many cases, actually loses in ability.

TABLE I

Grades	Time Allowed							
	Addition, 8 Minutes		Subtraction, 4 Minutes		Multiplication, 6 Minutes		Division, 8 Minutes	
	Attempts	Rights	Attempts	Rights	Attempts	Rights	Attempts	Rights
IV	8	6	8	6	6	4	4	2
V	9	7	9	7	7	5	6	4
VI	10	8	10	8	9	7	8	6
VII	11	9	11	9	10	8	10	8
VIII	12	11	12	11	11	10	12	11

4. They have demonstrated the need of drilling pupils in those four fundamentals in which they are deficient. To this end, a large number of the 70 elementary school districts have introduced several kinds of practice material in arithmetic, the relative merits of which are being studied by teachers and masters with a view to using that which proves most effective.

II. *Spelling.*—Proceeding from the fact that an eighth-grade pupil probably uses not more than twenty-five hundred words in his writing, whereas the spellers in common use contain from ten to fifteen thousand words, the department has worked as follows:

1. With the aid of many teachers minimal and supplementary lists of alleged difficult words have been prepared for each of the eight grades. These lists were placed in the hands of each teacher in the elementary schools, with the suggestion that the minimal list be emphasized in the spelling instruction (*School Document No. 8*, 1914).

2. The intention is by no means to limit the instruction to the words which are at present contained in the minimal list, but it is to make sure that the child learns to spell the words which he actually uses in his voluntary writing.

3. A test was given in May, 1915, to all grades above the second, for the purpose of determining the relative degree of difficulty of the words in the minimal lists.

4. As a result of that test each word is accompanied by a percentage, which indicates the number of pupils that spelled the word correctly. In this way each teacher is furnished with a list of alleged difficult words, together with information as to their relative degree of difficulty, thus making it possible for a teacher to place the emphasis in her instruction on the more difficult words (*School Document, No. 10*, 1915).

5. A further result of this test is to furnish each teacher with a standard by which she may judge whether her class is above or below the general standard for the city. If, for instance, a word is indicated as having been spelled correctly by 90 per cent of the children of the city, a teacher knows that if more than four out of the forty pupils in her class misspelled that word her class is below the standard ability of Boston children to spell that word.

6. A study has been made of the various lists of words that have recently been prepared as a result of scientific investigation, and the resulting list has been supplied to the teachers. It is the ultimate intention to make selections of words from this list to be added to the minimal lists until the minimal lists contain practically all of the words which are within the writing vocabularies of the normal pupils of each grade.

III. *English.*—Before the Department of Educational Investigation and Measurement was organized a Committee on Standards in English had been at work for some time and had set up some tentative requirements in English which the committee felt ought to be met by every pupil who graduates from the elementary schools. These requirements were approved by the Board of Superintendents and thus became authoritative standards. The requirements are as follows: Every graduate should be able:

1. To copy twelve lines of simple prose or poetry, and a bill of at least seven items. (Copying is not an end in itself, but a means to an end. The pupil should be made to see that accuracy in arithmetic, language, and other subjects may depend largely on accuracy in copying.)

2. To take down from dictation a passage of simple prose. (The purpose of dictation is to test language forms, punctuation, and spelling

already taught. It should never be used as a method of teaching. It should succeed and not precede a teaching lesson.)

3. To write from simple directions a friendly letter or an application for a position. (The letter is to be the pupil's own work, but he may be allowed to make corrections and to re-write. There should be no corrections by the teacher.)

4. To write within a half-hour a simple, original composition of not less than one page of letter paper, with every sentence grammatically complete. The pupil may make revisions, including interlinear corrections, but must not re-write.

In this composition the total number of serious errors in grammar, spelling, and punctuation should not exceed five—such errors, for example, as "I seen," "we was," "had wrote," "he try" for "he tried," "a women," the use of "they" for "there," "there" for "their," "to" for "too"; the misspelling of such common words as "Wednesday," "February," "eighth," "which," "stopped," "nineteen," "minute," "father," "mother," "English"; the omission of the period at the end of a sentence.

5. To recognize the parts of speech in their common uses; to explain the construction of words and phrases in a simple sentence containing not more than one phrase modifier in the subject and one phrase modifier in the predicate; to have a practical understanding of the uses to which the dependent clause of a complex sentence can be put—whether it be to serve as noun, adjective, or adverb; to know the principal parts of regular verbs and of the common irregular verbs, and their tense forms through the indicative mood.

6. To read at sight with readiness and good expression simple prose as difficult as *Little Men* or *Hans Brinker*.

7. To quote either orally or in writing fifty lines, not necessarily consecutive, of classic prose or poetry. (The pupil should look upon this not merely as something to be expected of him in the high school but also as a part of his equipment for life.)

8. To stand before the class and talk clearly on some subject of personal, school, or public interest.

The Committee on Standards in English is co-operating with the department in putting these requirements into effect. To this end, the department and the committee caused two tests to be given in

November, 1914, to 4,944 pupils in the first-year classes in the high schools. These tests were in accurate copying and in written memory work.

1. The test in accurate copying was to discover what degree of accuracy should be expected of pupils when they are asked to copy fifteen lines of prose in fifteen minutes.

2. The test in written memory work was to find out how well pupils remember the fifty lines of classic prose and poetry which the course of study requires that they shall have committed to memory before graduating from the elementary schools.

3. As a result of the test in accurate copying it has been found that boys will copy fifteen and one-half lines (4½ inches long) of prose in fifteen minutes, with 50 per cent of the pupils making less than five errors of any kind (spelling, capitalization, punctuation, words omitted, words added, wrong words used, misspelled words, undotted *i*'s and uncrossed *t*'s).

4. The same test shows that the girls will copy more than sixteen lines in fifteen minutes, and that 50 per cent of the girls will make less than three errors of any kind.

5. By giving a standard test under controlled conditions, it will be possible to give a similar test at some future date and determine whether or not improvement has been made.

IV. *Geography.*—In co-operation with the head of the Department of Geography in the normal school the department has given two tests to pupils in the eighth grade to determine:

1. How well pupils in the eighth grade remember the geography which they were taught in the earlier grades.

2. What ability pupils have to reason about geographical data.

3. Whether mere place-geography is being overemphasized in teaching.

V. *Penmanship.*—The quality of the handwriting of elementary-school graduates has been studied as follows:

1. Six-hundred specimen papers were selected from the 4,944 papers written in the test in accurate copying. The pupils were not aware that their handwriting was to be examined, hence they probably wrote in a natural, unrestrained manner.

2. These 600 specimen papers were rated according to the Ayres Scale for Adult Handwriting, using only the specimens in the scale

under 90, 70, 50, and 30. Specimens poorer than the 30 specimen in the scale were rated 10.

3. The specimens were rated by a committee of six teachers who are superior teachers of handwriting. Each paper was rated by three persons.

4. The final rating of a paper was determined in the following manner: Where two or more persons agreed, that rating was given the specimen; where no two agreed, the middle rating was assigned.

5. A further study is being made of the merits and defects exhibited in these 600 specimens and a report will be printed and distributed among the teachers.

B. REVISION OF THE ELEMENTARY COURSE OF STUDY

In co-operation with two of the assistant superintendents the department is supervising the revision of the course of study in the elementary schools. In order to assist the teacher to economize her time and energy by the adoption of more definite purposes in teaching, these special features are being introduced into the course.

1. A concise, definite statement of the aims to be accomplished in the teaching of each subject in each grade.

2. A statement of the irreducible minimal essentials in each subject in each grade.

3. A definition of the objective standards of achievement in various subjects as far as they have been worked out.

This revision is being made with the co-operation of about 40 committees, including 359 different teachers, working on the following subjects: arithmetic, reading, stories and literature, spelling, grammar, composition, dictation, geography, and history.

This utilization of the knowledge, ability, and experience of the teachers will be followed by further professional educational advice from principals and superintendents. This method of course of study revision has the advantage of building up a practical course of study based on classroom experience, of securing the sympathetic understanding by the teacher of the course when it is adopted, and of affording helpful stimulus and proper encouragement to the teaching staff which must follow from such professional recognition.

C. ORGANIZATION OF A PLAN FOR PROMOTION OF TEACHERS ON MERIT

Inasmuch as the higher positions in the school service must be filled by the superintendent when vacancies occur, the department has proceeded on the assumption that any plan of promotion, honestly administered, is better than no plan at all. The need of a systematic plan is seen in the following phases of the conditions in the Boston school system.

1. The size of the public-school system, with its nearly two thousand elementary and over five hundred high-school teachers, makes it impossible for the superintendent to know the work of the teachers except indirectly.

2. The variety of ranks both in the elementary and in the high schools makes relatively a large number of promotions within the service.

3. The large number of candidates who hold certificates making them eligible for promotion makes necessary some further plan for determining their relative professional qualifications.

The scope and method of the work of the department to formulate a plan will be illustrated by the following brief statements:

1. Several conferences have been held with sub-masters and master's assistants, because they are among those most interested in a plan of promotion on merit. Among other things, it was agreed, subject to the necessary official approval, that (*a*) the sub-master in the school where the vacancy occurs should be given first consideration for appointment; (*b*) other qualifications being equal, that sub-master in the service longest as sub-master should be appointed first; (*c*) ratings of teaching ability and estimates of probable future success should be secured from (i) assistant superintendents, (ii) masters of schools, (iii) director of promotion and educational measurement.

2. At a conference with the Board of Superintendents a common basis for securing discriminating and comparable ratings was agreed on.

3. A comprehensive basis for judging merit has been prepared by the department after a study of the available plans of rating teachers in cities throughout the country (see forms 264, 265, 266, and 267).

4. From April, 1914, when the department began work, to June 1, 1915, the following higher positions have been filled in accordance with the proposed plan, in so far as it has been worked out at the present

time. All appointments to higher positions between these dates have been made according to the merit system.

In elementary schools:		
First assistant, grammar	Women	1
First assistant in charge	Women	7
Master's assistant	Women	5
Sub-master	Men	5
Master	Men	5
	Women	1
In high schools:		
Master, head of department	Men	1
Head master	Men	4

CHAPTER VI

THE APPLICATION OF STANDARD MEASUREMENTS TO SCHOOL ADMINISTRATION

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A study of the educational literature of recent years reveals a steadily increasing interest in the possibility of the application of standard tests and measurements to the problems of school administration. Many prominent educators honestly question the value of such tests, because they feel that the most important elements in the mental and moral development of pupils are of an intangible character which can by no possibility be confined in terms of measurement. No one would dispute the fact that human life is a deeper and more complicated subject than can be probed by quantitative tests; nevertheless, when the more subtle components have been excluded, there remain some essential elements in education which are purely objective, and that these can be measured with reasonable exactness there is no reason to doubt. Because some things of supreme importance cannot be included in this category is no valid argument for rejecting the entire plan. We measure a man in terms of achievement; to apply to the schools the same test, the ability to produce results, is only logical and reasonable. The spiritual side of education is real and in all probability defies measurement, but a complete education includes elements other than the spiritual, and so far as they are present they can be measured. If they are so vague and indefinite as to escape measurement, their existence may well be doubted. The more clearly the objective results of education are understood, the greater the appreciation of the spiritual elements in the child's training. To reassure those who feel that any effort to arrive at a definite knowledge of educational values carries with it the danger of obtruding commercial methods into the region of things of the spirit, the well-proved truth may be reiterated here: the more clearly the objective results of education are understood the greater is the appreciation of the fact that unless all three natures, physical, mental, and spiritual, are being

definitely led toward their fulfilment, no system of child-training is even approaching the adequate performance of its function.

The mechanical application of standard tests with the resultant accumulation of medians, graphs, and charts is in itself a futile thing. Only as these tests are informed and controlled by a trained and sympathetic mind using the facts revealed as the basis of a constructive policy for future work do they find their justification. They show to a superintendent the extent to which his plans have been correctly interpreted and put into operation, and they furnish him with a sound basis for necessary changes, whether in the way of revision or of the introduction of new methods.

Because of the increasingly heavy demands upon the public schools, economy of time and of energy in every direction has become a necessity. Consider the relatively simple subject of penmanship. Once a pupil's handwriting was acceptable if the letters were well formed and the lines even, and the method of achieving this result was left largely to nature, or, when she had failed in the bestowal of the necessary gift, to the child's dogged patience in drawing over and over something resembling the copperplate sentence at the top of his writing-book. Now, writing has been differentiated from drawing, and every motion has been analyzed; unaccustomed muscles must be trained and co-ordination established; form must still be maintained, but the emphasis has been shifted to power; legibility must be accompanied by speed and a degree of freedom which makes it possible to continue the rapid, even movement for long stretches of time without fatigue. The problem before the school is how to meet these entirely reasonable demands without unduly prolonging the amount of time which may fairly be assigned to the subject. To this end the department of superintendence must know unmistakably every point of success or failure in the penmanship teaching and drill throughout the whole school system, that waste of time and effort may be eliminated. By what method shall the facts be ascertained most quickly and effectively?

Spelling is another comparatively simple subject, with a comparatively short time allotted to it in the school program. Questions like these face the teacher and the superintendent: Is the method in use producing accuracy? Is drill being wasted upon unusual words which will in all probability never find a permanent place in the child's vocabulary? Is drill on many words being carried beyond the point necessary

for fixing them in the memory? Has every child a limited working vocabulary which it is impossible for him to spell incorrectly?

Unsupported opinion can no longer be brought forward to decide, even in cumulative fashion, these and manifold other points which arise. What twenty eminent educators think as to the efficacy of a certain method gives way before the facts which careful investigation shows. Valid conclusions can be based only upon the results of accurate tests applied to large groups and continued for a sufficient length of time to eliminate possible error. If, as has already been said, such tests result only in the mere accumulation of educational statistics, they fail to justify the attendant expenditure of time and energy. They must surely function in an improvement in schoolroom practice or they are worse than useless. Unfortunately, it is precisely at this essential point that the vitality which should inform the laboriously acquired statistics is allowed to escape, leaving an inert mass of figures to show that someone has been busily and vaguely occupied about something. In education, as in every other department of life, the demand is not "Be busy about something," but "Be busy to some purpose."

So simple material as the relationship of "age and grade" should be carefully interpreted, and the inferences drawn from it should be a factor in shaping the school policies for the ensuing year. Percentage of promotion, "mortality" both in the grades and in the high school, the number of pupils accelerated or retarded, and other data of this character furnish evidence for a diagnosis of the health of the school body.

As a case in point may be cited the age-and-grade table of the Montclair, New Jersey, schools for September, 1912, which showed 23 per cent of retardation. Since this seemed too large for such a community, the superintendent and principals met for a discussion of plans looking toward the improvement of the situation. No radical steps were taken, but the schools were fully aroused to their responsibility for the excessive number of repeaters, with the result that the needs of individual children were given more careful consideration and a greater degree of flexibility was infused into school administration. In September of the following year figures were compiled on the same basis and the totals, which showed a decided improvement, formed the subject of another discussion. Four years of this policy have reduced the percentage of retardation almost 50 per cent.

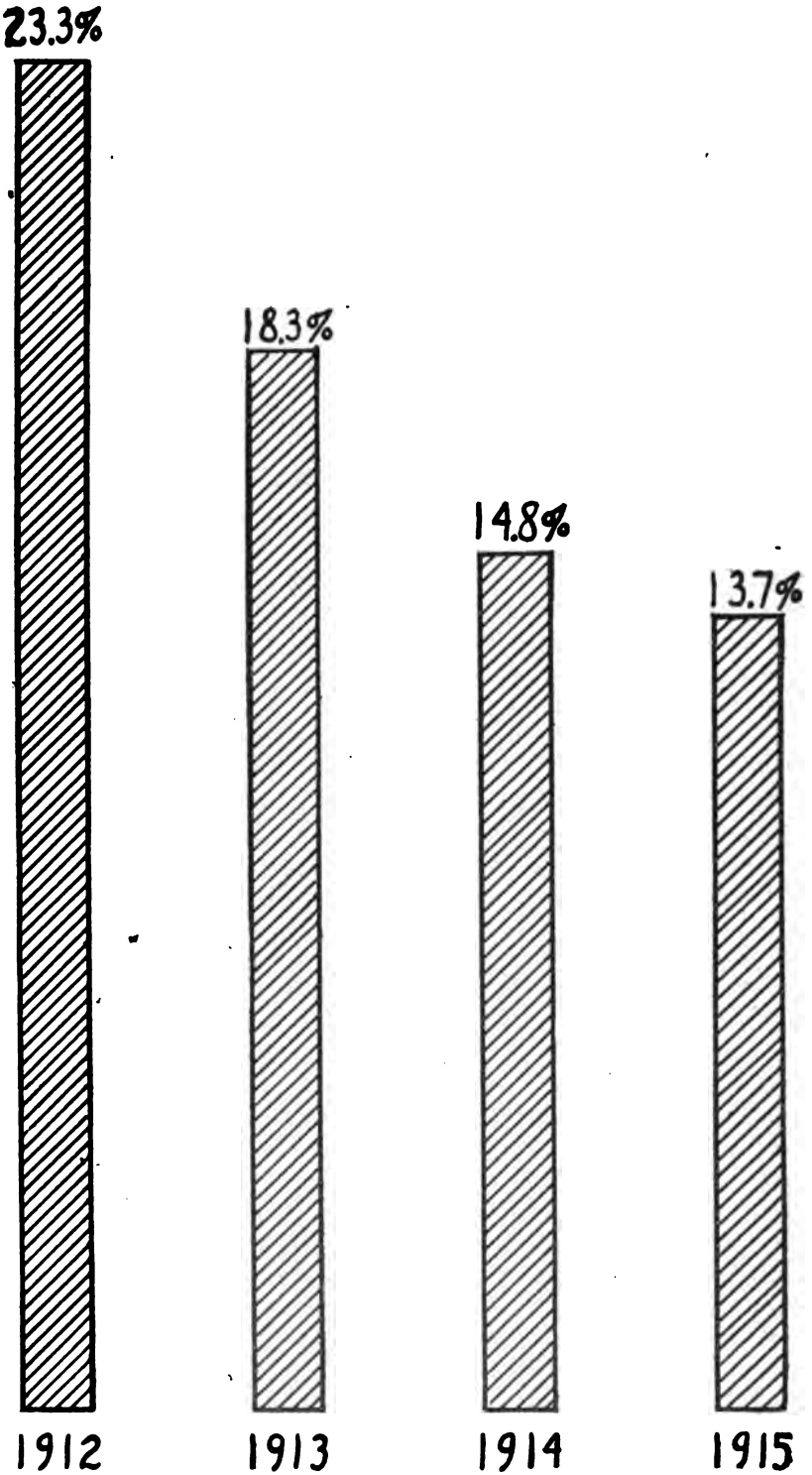

CHART I.—Percentage of retardation in Montclair schools in successive years, showing steady reduction.

The same general plan for determining values can be applied to such questions as the wisdom of the establishment of open-window classes; which, it may be said in passing, should be distinguished from the open-air classes—a wholly different problem. The argument in favor of open-window classes seems faultless. Fresh air is essential to health; it has proved effective as a healing agent in cases of tuberculosis. Anaemic children are benefited by open-air rooms. The inference is that healthy children will show a still greater improvement, owing to their better physical status. The theory seems flawless, but we need to assure ourselves that the facts accord with the theory, and the only way to determine this is to test it. One test is to weigh the children of the open-window class at certain intervals and then compare the change in weights with the change in weights of an equal number of children who are in a classroom of the usual type. The chances are that a superintendent who has before him such a record as is shown in Chart II will hesitate before extending the plan to his entire school system. Especially will this be true if other tests of a different character point to the same conclusion.

In dealing with subnormal pupils the opinion generally prevails that they should be given a form of education in which the manual arts predominate. It is also believed that defective children who seem to learn readily and are able to recite fluently are doing it in parrot-like fashion and that even this seeming facility will not long persist, that it is simply a case of learning something today and forgetting it tomorrow. Obviously, it is of great importance to the teacher to know whether this assumption is true of the individual pupils in her care, or whether she may stress the academic phase of her work with some hope of making an enduring impression. Only by testing the individual pupils is she able to determine the character of the training suited to each.

The possibilities of the standard scale for such children are shown by the records in penmanship and arithmetic of a subnormal class last year. A local scale, based upon that of Dr. Thorndike, was used to measure the quality of the handwriting of all members of the class, and this formal rating was made once in two months. The arithmetic scale consisted of ten problems in fundamental operations. A definite time-limit was fixed for the solution of these problems. No credit was given for incorrect results or omitted examples. The records made by a subnormal pupil in the two subjects appear in Charts III and IV.

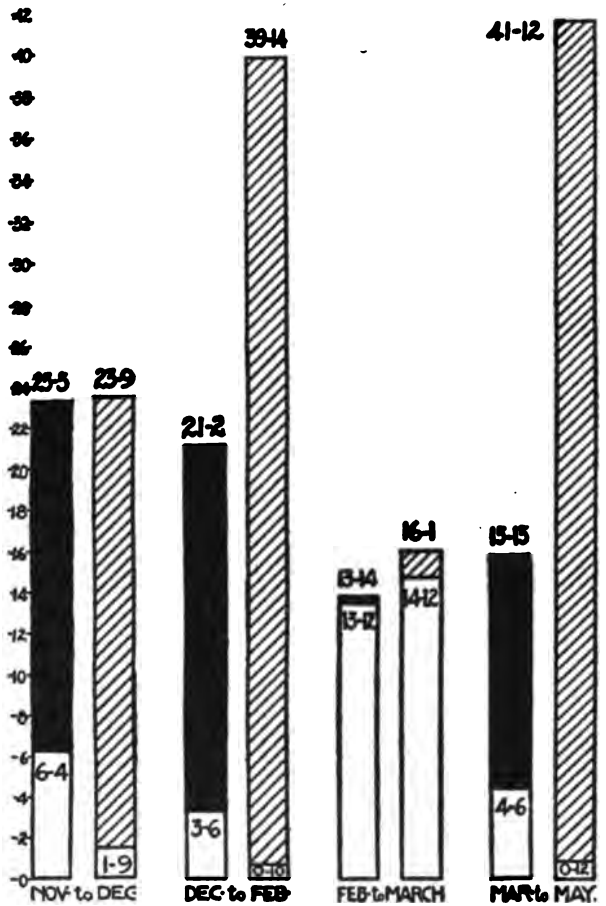

CHART II.—Gains and losses in weight of open-window class and of control class at Montclair, New Jersey. (The first column in each time group represents the open-window class, the second the control class. The entire height of the columns shows weight gain while the white portion records weight loss. Thus, from November to December the pupils of the open-window class gained 23 lbs. 5 oz. and lost 6 lbs. 4 oz., making a net gain of 17 lbs. 1 oz., which is shown by the blackening of the upper portion of the columns. During the same period the pupils of the control class gained 23 lbs. 9 oz., and lost 1 lb. 9 oz., leaving a net gain of 22 lbs. In every time group the control class showed a greater net gain than the open-window class.)

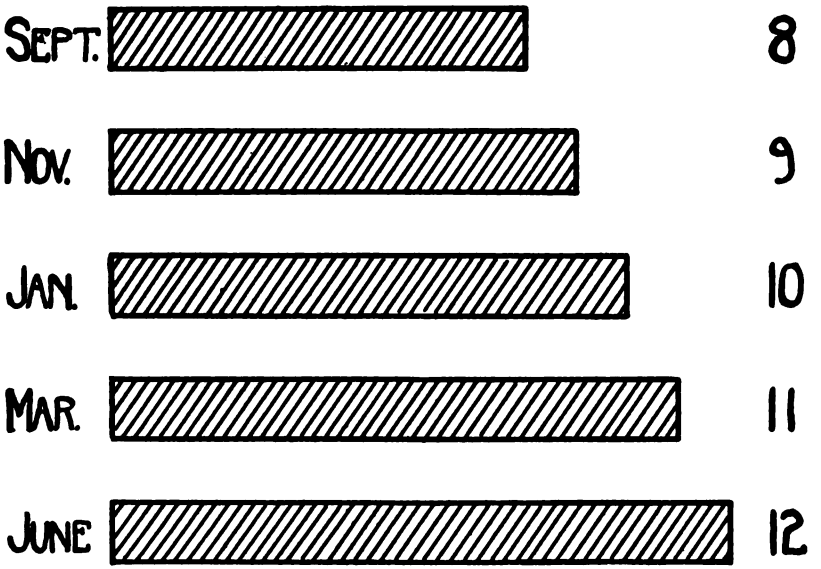

CHART III.—Performance in handwriting of a subnormal pupil. (The quality of the handwriting is indicated by the length of the hatched oblong and also by the digit at the right. The improvement is steady from September to June.)

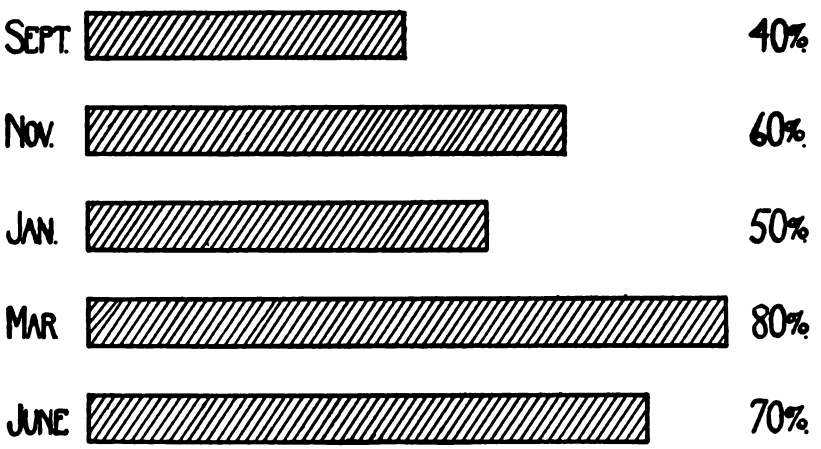

CHART IV.—Performance in arithmetic of a subnormal pupil. (The figure at the right shows the percentage of correct answers.)

In the purely mechanical process of writing there would seem to be no doubt that this pupil benefited directly from the teaching. In arithmetic the progress is not so evident.

The fact that the arithmetic test was confined to examples in fundamental operations of the same degree of difficulty made the tests practically uniform. It is very doubtful if a pupil whose record fluctuates to the extent indicated above receives any permanent value from such exercises. Similar charts made of every pupil in the class showed the same general tendency; improvement in penmanship was fairly constant, while in arithmetic frequent lapses appeared.

By the use of the standard scale the superintendent is enabled to check the results of any experiment in his schools and banish, from his own mind at least, any lingering doubts as to the wisdom or lack of wisdom of what he has undertaken. An experiment in one of the Montclair schools with a precocious class is a case in point. In September, 1912, in this school, a group of fourth-grade children of fairly uniform and

TABLE I

RECORD OF TESTS

	Fractions	English	Spelling	Writing	Fundamental Operations	Superintendent's Test Composition
Watchung VIIA....	83.6	81	98	11.6	78	42.2
Watchung VIIB....	86.9	80	98	11.2	80	45.4
Grove VIIA.....	77	71	97	11.4	69	45.4
Special group.....	87	83	97	11.1	83	45.8

superior ability was put in charge of a strong teacher who was instructed to allow the class to advance as rapidly as it desired. No pressure was ever brought to bear upon the pupils, but dawdling was discouraged. The class remained with the same teacher for two years and in this time did three years of work. Four months after the special group entered the seventh grade, careful tests were made to determine to what extent the experiment had been a success or failure. A comparison of the record of the special seventh-grade pupils with that of the entire seventh grade with which they had been merged and with two other seventh grades of a similar type showed a very gratifying situation. Tests in spelling, arithmetic, and English were given by the principal and a

standard test in composition by the superintendent, while the penmanship was rated by the writing supervisor. A conclusion based upon the results obtained from these three separate and independent sources can fairly be presumed to represent the facts (Table I).

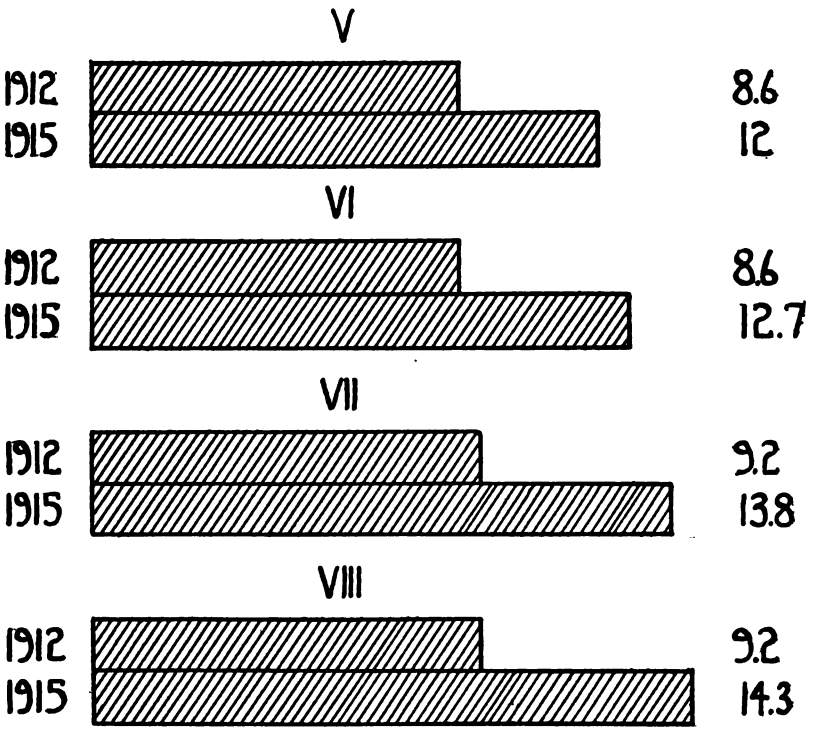

CHART V.—Improvement in penmanship in Grades V–VIII at Montclair, New Jersey, resulting from the use of a standard measuring scale. (The upper portion of each horizontal band represents the quality of the penmanship in the grade indicated in September, 1912. The lower portion shows the quality reached in June, 1915.)

It should be noted that the records in spelling, fundamental operations, complex fractions, and English show rank in percentage, while the penmanship rating and the superintendent's test are given in points and should be interpreted only as furnishing a basis for comparison.

That the children had not been advanced too rapidly is further indicated by the fact that all of them were regularly promoted at the

end of the year to the eighth grade, where they are now doing excellent work.

Standard tests are not only useful in bringing out the facts concerning pupils and classes, but are equally valuable in indicating general tendencies in the system as a whole. A recent school survey revealed the fact that in a certain system of schools the pupils in the fourth grade wrote practically as well as those in the fifth grade, while the hand writing of sixth-grade pupils was actually better than that of children in the seventh grade. Such a departure from a normal curve of advance may be justified by some unusual condition. However, the supervisory department should be fully aware of the facts if effective remedial measures are to be applied, and no amount of theorizing will furnish these facts. They can be obtained in only one way—by the application of one of the standard tests in penmanship. With the returns from such a test tabulated and charted, the situation in every grade is at least reasonably clear and a definite policy can then be formulated with some chance of reaching the root of the difficulty.

The effect of the use for three years of a standard penmanship scale upon the quality of the writing of public-school children is indicated in Chart V.

It is perhaps impossible to show by figures the total effect which tests of the type indicated here produce in the quality of the work of the schools. When purposeful effort is substituted for aimless drifting, there can be no permanent withholding of successful results. The only limits to investigation of this kind are those determined by the time which the supervisory department can afford to give to the work. It is based upon the fundamental idea of a continual local survey, made by those who know the actual school conditions, and who are seeking the facts as they exist, for the sole purpose of formulating constructive policies.

CHAPTER VII

A HALF-YEAR'S PROGRESS IN THE ACHIEVEMENT OF ONE SCHOOL SYSTEM

H. G. CHILDS
Associate Professor of Education, Indiana University

SECTION A. THE PROGRESS AS MEASURED BY THE THORNDIKE VISUAL VOCABULARY TEST

The following report is based upon the responses of 754 pupils in the Bloomington, Indiana, schools to the Thorndike visual vocabulary test, which was given during the first week in February and again the first week in June, 1915. Only the papers of those pupils were considered who wrote both tests. The grades included are the IVB to the VIIIA inclusive.

The usual method of tabulating the results has not been followed, as the writer thinks that method not the best suited to show the actual achievement of any pupil; for example, the first two papers the writer took from a pile were each scored "line 7." In the first of these papers the pupil had made the correct response to every word in lines 4, 5, 6, and 7 and to one word of line 9. In the other paper correct responses had been made to every word in lines 4, 5, and 6, to four words of line 7, to two words each of lines 9 and 10½, to three words each of lines 8 and 10, and to one word of line 11. While both these papers were scored as of equal value, the writer is convinced that the ability of the second pupil should be rated as nearly double that of the first. By the method of scoring used in this report, the first pupil receives a mark of 119 and the second a mark of 214.3.

Assuming that the line values of the scale are correctly assigned (the Indiana results indicate that radical revision is needed), and that each word within any line is approximately of the same value as any other word of that line, why not assign a definite score for each word depending upon the line it is in? Such a marking scheme will give a pupil

credit for what he actually accomplishes in the test, and will have the added advantage of stating the pupil or class ability in one numerical result which can be treated statistically with greater ease than in the Thorndike scheme.

The papers in this report have been graded on this basis: every correct response in line 4, four points; line 5, five points; line 6, six points, etc.—line eleven, 18.3 points. The sum of all the word points represents the total value of the paper.

For comparative purposes the score of any paper or class median can be reduced to line and word values of the scale thus: line 4 has a range of value from 0 to 20; line 5, 21–45; line 6, 46–75; line 7, 76–110; line 8, 111–150; line 9, 151–195; line 10, 196–245; line 10½, 246–297.5; and line 11, 298–352.5.

By this scheme the ability of a pupil or of a class may be stated in fractional parts of a line or in terms of the first, second, etc., words within a given line; e.g., a pupil whose score is 126 has an ability equal to that represented by line 7 and 16 points additional, which is four-tenths of line 8, or two words of this line.

Table I shows the results of the February and June tests. The features to which attention is called are: (1) the score of each grade in the February test, (2) the gain from grade to grade in the February test, (3) the gain of each grade from February to June.

From this table the median gain from grade to grade by the February test is 18.8, or, stated in other terms, this gain is the equivalent of three words of line 6 or of two words of line 9. The greatest difference, 38.5, is between Grades VIB and VIA; and the least, 6.7, is between Grades VIIB and VIIA. The median gains within each of the grades between the February and June tests is 17.3; the highest, 37.5, is in Grade VIB and the lowest, 3.9, in Grade VIIIA.

It will be noted that the curves of Chart I show no marked plateaus and that the achievement in the VIB grade is double that in the IVB, while the VIIIA median is three times that of the IVB. This seems to indicate a steady and normal vocabulary development.

As comparable tests were not available, the same tests were given in June as in February. Whether the gain during the term is due to the natural growth in vocabulary on the part of the pupils or to their having remembered some of the words from the February test and looked

them up afterward as a matter of curiosity, I cannot say. I think the latter is true in only a very few cases.

TABLE I

THORNDIKE VISUAL VOCABULARY TEST (754 CASES)

Grade	No. of Pupils	Date	Score	P.E.	Line Value	February Difference between Grades	Gain during Term
IVB	91	Feb.	81.3	28.5	7.18	.....	
		June	92.5	28.5	7.5		11.2
IVA	85	Feb.	107.5	34.8	7.93	26.2	
		June	134.8	35.6	8.62		27.3
VB.....	65	Feb.	129.0	48.8	8.47	21.5	
		June	151.0	41.6	9.02		22.0
VA.....	102	Feb.	145.3	34.0	8.88	16.3	
		June	156.0	30.4	9.13		10.7
VIB	81	Feb.	164.1	43.0	9.31	18.8	
		June	201.6	43.5	10.12		37.5
VIA.....	83	Feb.	202.6	28.0	10.15	38.5	
		June	219.5	34.1	10.45		16.9
VIIB ...	62	Feb.	212.8	33.0	10.36	10.2	
		June	229.8	31.7	10.7		17.0
VIIA ...	69	Feb.	219.5	35.0	10.45	6.7	
		June	240.3	37.3	10.91		20.8
VIIIB ..	60	Feb.	238.6	35.0	10.87	19.1	
		June	256.1	32.9	10½.21		17.5
VIIIA ..	56	Feb.	254.1	36.7	10½.17	15.5	
		June	258.0	48.3	10½.24		3.9
Grade median		Feb.	183.3	34.9	9.73	18.8	
		June	210.6	34.8	10.28		17.3

To determine if any correlation existed between estimated teaching efficiency and class improvement in the vocabulary test, the writer secured the ratings of several competent judges on a considerable group of teachers in the grades from the IVB to VIIIA. In the IV and V grades where the work was non-departmental, the coefficient of correlation was negative; in the VI, VII and VIII grades where the teachers

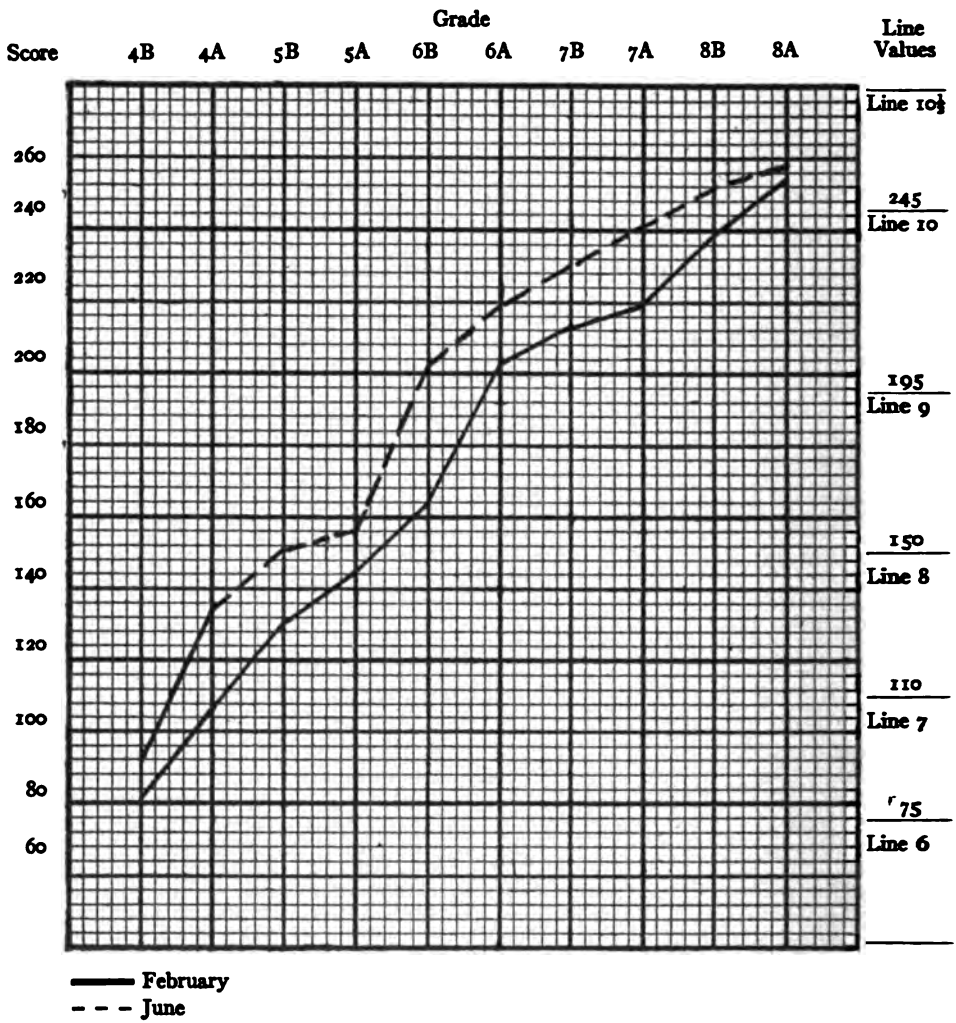

CHART I.—Graphic representation of the progress in visual vocabulary of 754 pupils at Bloomington, Indiana, based on Table I.

of reading and literature were employed for their ability in this line, the coefficient was between 0.6 and 0.7.

SECTION B. THE PROGRESS AS MEASURED BY THE COURTIS TESTS, SERIES B

During the second semester of the school year 1914–15, the writer, in conjunction with Mr. H. L. Smith, then superintendent of the Bloomington, Indiana, schools, gave the Courtis arithmetic tests in all grades of the elementary school from the IVB to the VIIIA, inclusive, for the purpose of measuring the growth in arithmetical achievement of pupils in this system. The tests were given during the first week in February and again the first week in June. The records of the 809 pupils who wrote both tests alone are included.

Table II indicates the number of pupils in each grade who wrote both tests and also the median number of attempts and rights, the percentage of accuracy, the percentage gain in rights, and the percentage gain in accuracy, for each of the four fundamental processes and for both the February and the June tests.

From this table the gain in achievement from grade to grade may be noted for the same date and for each of the processes; also the growth in achievement for each process between the February and June tests for each grade; and relative achievements in the different processes for the same grade and date may be compared.

In explanation of the results here set forth in comparison with those of other systems, it may be noted that formal work in arithmetic is begun in the Bloomington schools in the IIIB grade.

Table II and the accompanying charts show the following features worthy of note: (1) the slight gain from grade to grade in the February addition results for *rights;* (2) the marked gain in *rights* in addition of the June over the February results in Grades VI, VII, VIII; (3) a marked gain in *rights* in subtraction from grade to grade, but a decreasing ratio of gain between the February and June tests from Grade IVB to Grade VIIIA—there being an actual loss in achievement in rights in Grades VIIA, VIIIB, and VIIIA; (4) the slight progress in achievement in multiplication from grade to grade and the lack of improvement of the June over the February results except in Grade IV; (5) the marked gain in division from grade to grade in both tests but the lack of any marked improvement of the June over the February results in any grade —there being a moderate gain in Grades IV, V, and VIIIA; (6) that the actual achievements in attempts, rights, and accuracy in Grade IVB

TABLE II

ADDITION

Grade	No. of Pupils	Date	Attempts	Rights	Accuracy	Percent Gain in Rights	Percent Gain in Accuracy
IVB	95	Feb.	5.8	3.2	55.2		
		June	7.0	3.8	54.3	18.8	− 0.9
IVA	105	Feb.	6.7	3.5	52.2		
		June	7.9	4.4	55.7	25.9	3.5
VB	79	Feb.	8.1	4.5	55.5		
		June	8.3	4.6	55.4	2.2	− 0.1
VA	107	Feb.	8.4	5.3	63.1		
		June	8.4	4.9	58.3	− 7.5	− 4.8
VIB	83	Feb.	8.7	5.5	64		
		June	9.7	6.9	72	25.5	8.0
VIA	83	Feb.	9.0	5.3	59		
		June	10.5	7.5	71	41.5	12.0
VIIB	63	Feb.	9.7	5.6	60		
		June	10.8	8.1	75	44.6	15.0
VIIA	67	Feb.	9.8	6.0	62		
		June	11.8	8.4	71	40.0	9.0
VIIIB	65	Feb.	11.4	6.9	61		
		June	12.0	9.3	78	34.8	17.0
VIIIA	62	Feb.	11.5	6.3	55		
		June	13.7	10.4	76	65.1	21.0

SUBTRACTION

IVB	95	Feb.	5.2	2.6	50.0		
		June	6.7	4.7	70.1	80.0	20.1
IVA	105	Feb.	5.7	3.5	61.4		
		June	6.7	4.2	62.7	20.0	1.3
VB	79	Feb.	6.7	4.6	68.9		
		June	7.9	5.1	64.5	10.9	− 4.4
VA	107	Feb.	7.3	4.7	64.8		
		June	8.1	5.3	65.4	13.0	0.6
VIB	83	Feb.	8.0	5.5	69		
		June	8.1	6.0	74	9.1	5.0
VIA	83	Feb.	9.1	7.1	79		
		June	9.1	7.2	79	1.4	0.0
VIIB	63	Feb.	9.7	7.6	79		
		June	9.5	7.6	80	0.0	1.0
VIIA	67	Feb.	10.4	7.6	73		
		June	10.1	7.2	71	− 5.3	− 2.0
VIIIB	65	Feb.	11.0	8.8	80		
		June	10.8	8.3	77	− 5.7	− 3.0
VIIIA	62	Feb.	13.0	10.3	79		
		June	11.9	9.7	82	− 5.8	3.0

TABLE II—*Continued*

MULTIPLICATION

Grade	No. of Pupils	Date	Attempts	Rights	Accuracy	Percent Gain In	
						Rights	Accuracy
IVB	95	Feb.	4.2	1.9	45.2		
		June	5.9	3.2	54.2	68.4	9.0
IVA	105	Feb.	5.2	2.4	46.2		
		June	6.2	3.7	59.7	59.2	13.5
VB	79	Feb.	6.3	3.9	61.9		
		June	6.9	3.7	53.6	− 5.1	− 8.3
VA	107	Feb.	6.6	4.3	65.1		
		June	7.1	4.5	63.4	4.7	− 1.7
VIB	83	Feb.	6.7	4.3	64.2		
		June	6.6	4.4	66.7	2.3	2.5
VIA	83	Feb.	7.0	4.6	65.7		
		June	7.4	4.7	63.5	2.2	− 2.2
VIIB	63	Feb.	8.0	5.0	62.5		
		June	7.8	4.7	60.2	− 6.0	− 2.3
VIIA	67	Feb.	8.5	5.5	64.7		
		June	8.7	5.4	62	− 1.8	− 2.7
VIIIB	65	Feb.	9.0	6.0	66.7		
		June	9.4	6.2	66.5	3.3	− 0.2
VIIIA	62	Feb.	10.1	6.2	61.3		
		June	10.2	6.7	65.7	8.1	4.4

DIVISION

IVB	95	Feb.	1.3	0.5	38.4		
		June	4.4	1.8	40.9	260.0	2.5
IVA	105	Feb.	3.8	1.5	39.5		
		June	4.8	3.0	62.5	100.0	23.0
VB	79	Feb.	4.6	2.8	60.9		
		June	5.5	3.2	58.2	14.3	− 2.7
VA	107	Feb.	5.5	3.7	56.1		
		June	6.3	4.6	73.5	24.3	17.5
VIB	83	Feb.	6.0	4.6	76.7		
		June	6.8	4.3	63.2	− 6.5	−13.5
VIA	83	Feb.	6.5	5.3	81.5		
		June	6.7	5.4	80.6	1.9	− 0.9
VIIB	63	Feb.	7.4	6.0	81.0		
		June	7.3	6.4	87.7	6.7	6.7
VIIA	67	Feb.	8.8	7.1	80.7		
		June	8.8	7.5	85.2	5.6	4.5
VIIIB	65	Feb.	9.4	8.2	87.2		
		June	9.2	8.0	87.0	− 2.4	− 0.2
VIIIA	62	Feb.	10.4	8.9	85.6		
		June	11.1	9.8	88.3	10.1	2.7

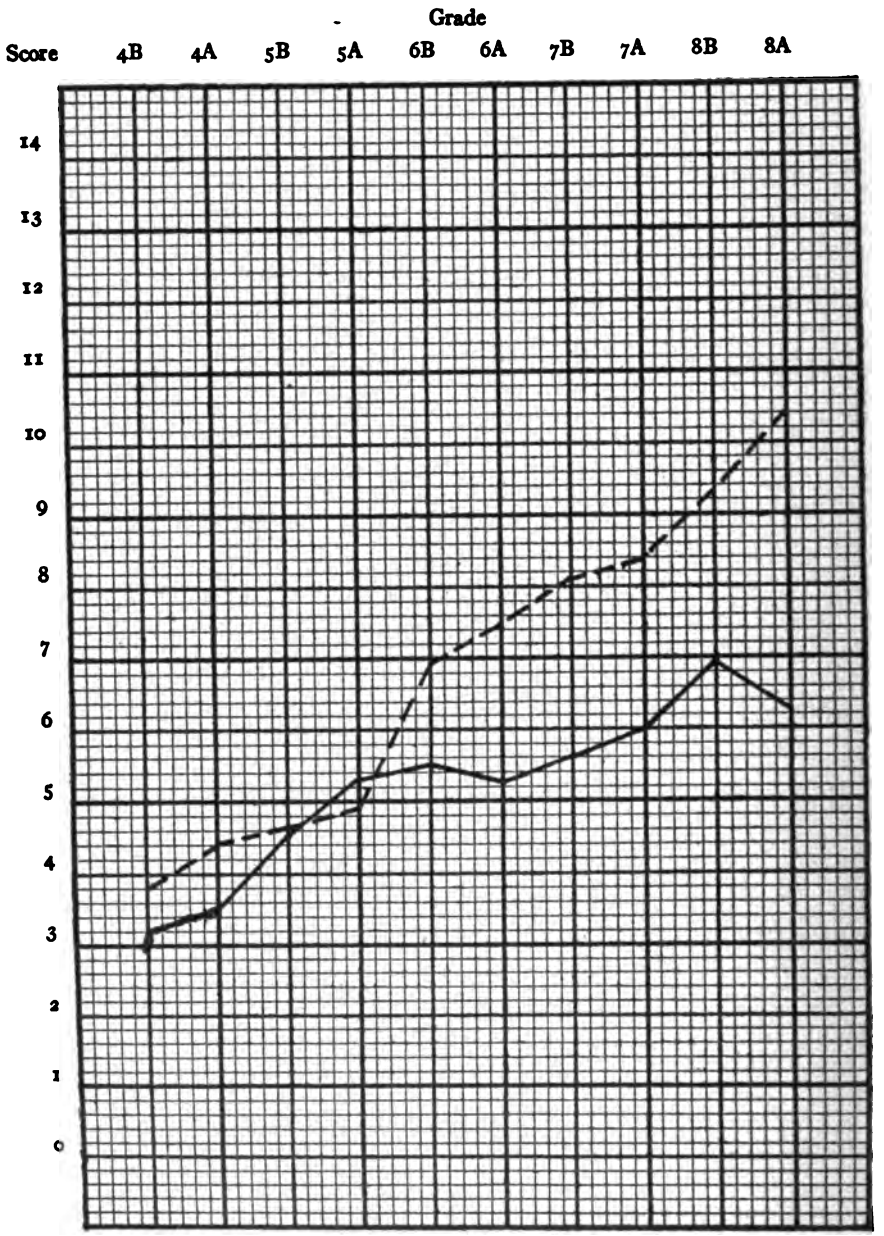

CHART II.—Progress in arithmetical achievement at Bloomington, Indiana. Addition, rights.

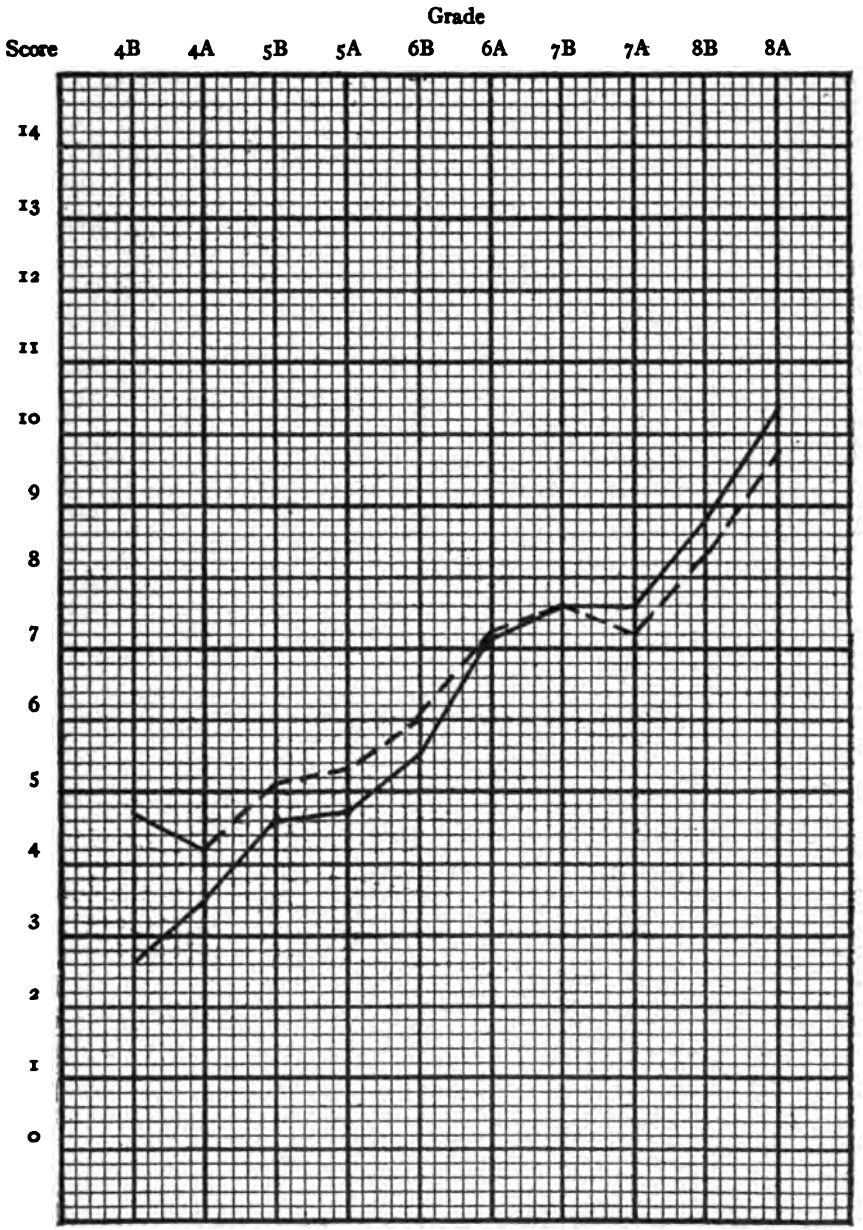

CHART III.—Progress in arithmetical achievement at Bloomington, Indiana. Subtraction, rights.

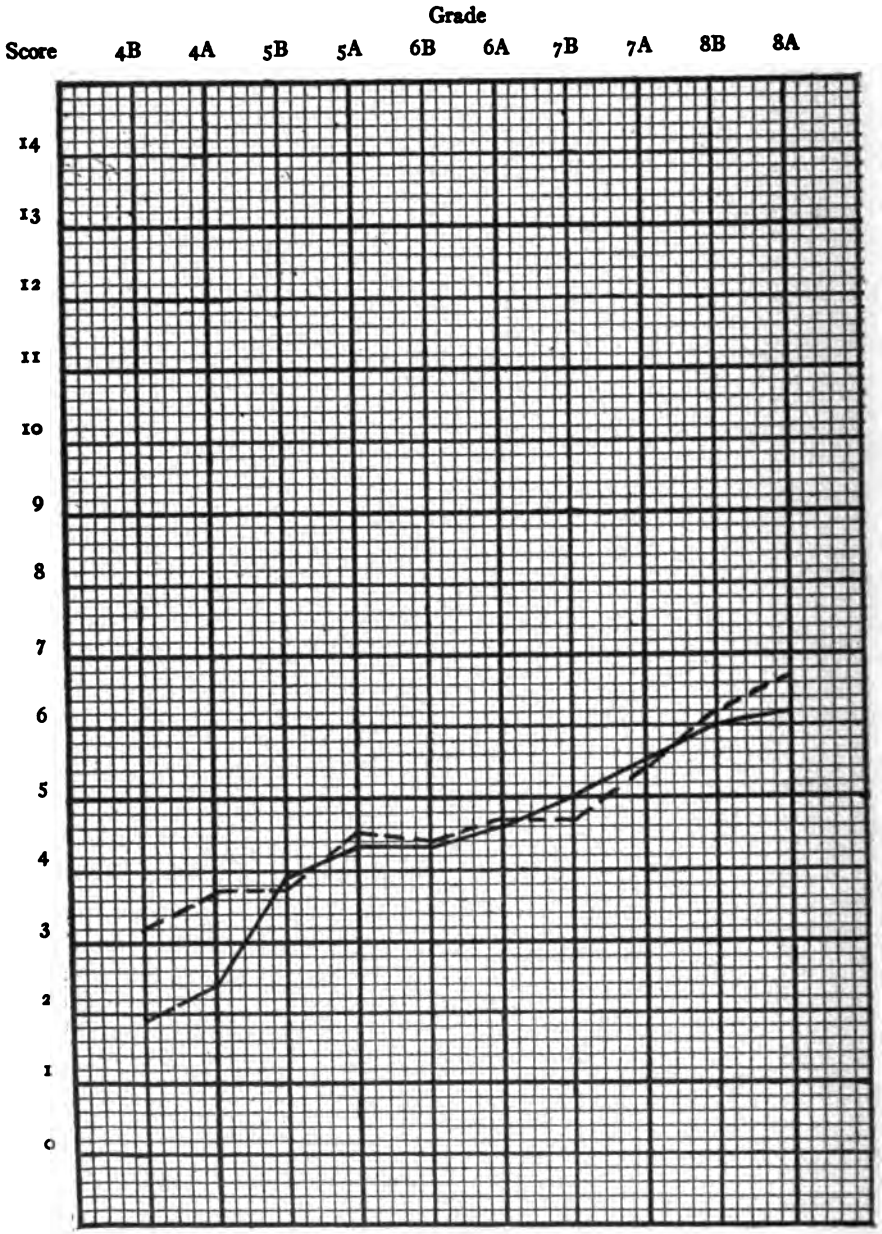

CHART IV.—Progress in arithmetical achievement at Bloomington, Indiana. Multiplication, rights.

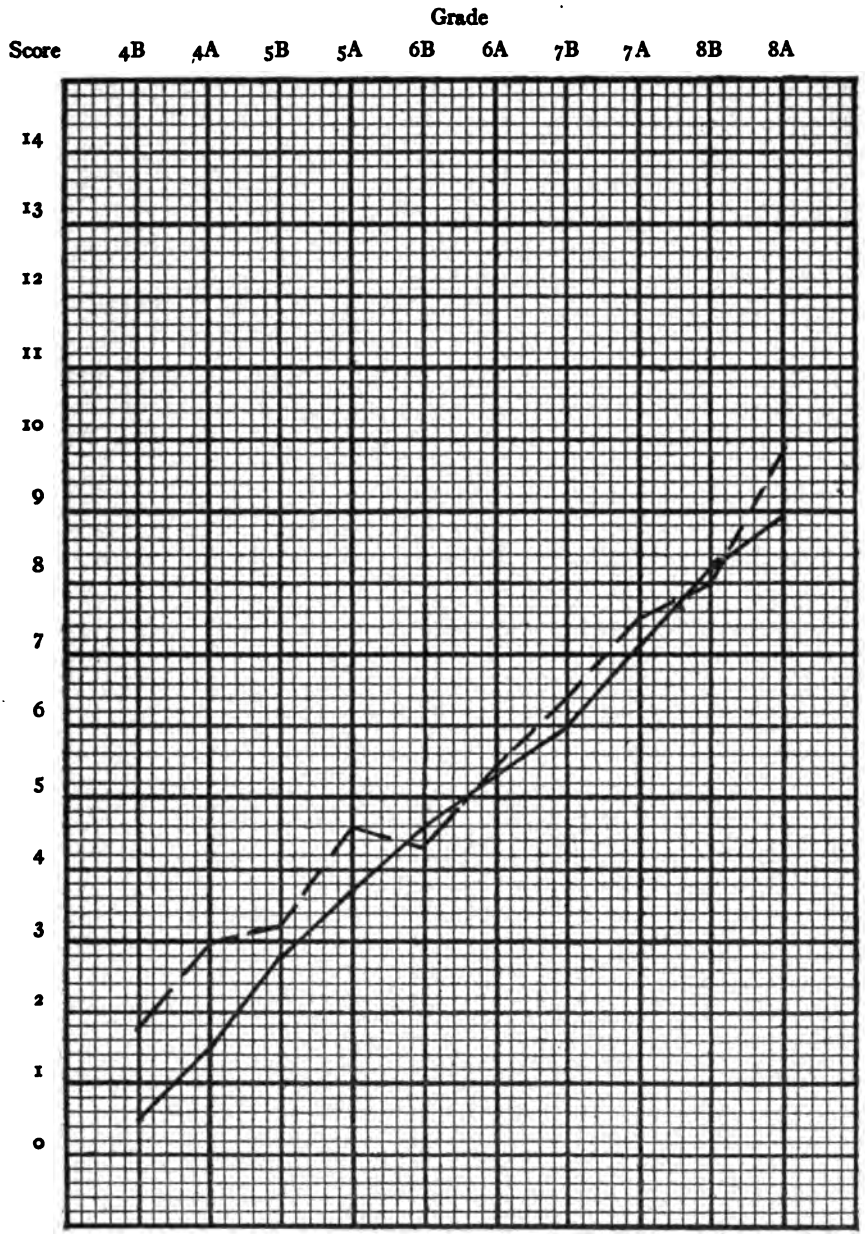

CHART V.—Progress in arithmetical achievement at Bloomington, Indiana. Division, rights.

are highest in the order of processes as follows: addition, subtraction, multiplication, and division. In Grade VIIIA (save for the drill influence in addition) the order is division, subtraction, addition, and multiplication—the latter two have about equal rank; (7) that the increase in accuracy from grade to grade is most pronounced in division, ranging from 38.4 in the IVB February test to 89 in the VIIIA June test; and is least pronounced in addition (save for the drill influence preceding the June test); the percentage of accuracy as indicated by the February test is 55 in both Grades IVB and VIIIA.

The marked gain in accuracy and in rights between the February and the June tests in addition in Grades VI, VII, and VIII, is accounted for by the fact that a five-minute daily drill in addition was given for a period of ten weeks in the interval between the two tests in these grades.[1]

An average gain in rights of 42 per cent and in accuracy of 14 per cent in addition, under drill conditions between the February and June tests, in Grades VI, VII, and VIII, indicates that present standards, under conditions of ordinary class work, are no indication of what these standards should be when experimentation has shown the way to a better procedure.

The marked gain in results in addition between the February and the June tests and the lack of gains in the other processes in Grades VI, VII, and VIII indicate that results may be expected at the point where pressure is exerted and that there is no appreciable transfer of training from one process to another.

In grades from IVB to VIIIA, the teachers were rated as to their general efficiency by four judges and the averages of these ratings were correlated with the amount each teacher's class gains in arithmetic were above or below the median class gain, as measured by the February and June tests. In Grades IV and V, where the teachers have charge of all subjects, the Pearson coefficient was about +0.30, but in the departmental grades, where teachers of arithmetic are employed because of their proficiency in teaching this subject, the coefficient of correlation was above +0.90.

These results are offered as data from one school system only and are not to be considered as determined general standards of achievement and growth in arithmetical abilities.

[1] Acknowledgments are due to Miss Mary Kerr, principal of the departmental school, who planned and carried out the drill work in addition and assisted in the tabulation of results.

CHAPTER VIII

COURTIS TESTS IN ARITHMETIC: VALUE TO SUPERINTENDENTS AND TEACHERS

S. A. COURTIS
Supervisor of Educational Research, Detroit, Michigan

From August 1, 1914, to August 1, 1915, between four and five hundred thousand tests (455,007) of the various Courtis standard research tests were sent from Detroit to school men in 42 different states. This material was mainly Series B Arithmetic Tests, and the growth from the use of the tests by a single school in 1909 may be taken as an index of the growth throughout the United States of the interest in the movement for measurement. It should be evident at once that if this great quantity of material is being used so as to result in benefit to the schools tested, then measurement must be already exerting throughout the country a very widespread influence on the teaching of arithmetic. On the other hand, this extensive use of testing material may represent merely natural curiosity and an experimental trial by wide-awake school men of a new and much-discussed type of examination.

Fortunately, measurement itself is not on trial. The movement for measurement is merely an application of scientific methods to the study of educational problems. Both as a general method for the discovery of natural law and as a method of proved worth in education, the method of science rests on so sure a foundation that for a school man to declare that in his hands measurement has been a failure is to confess his own lack of training or his own incompetency. As for the Courtis tests, they were designed by the writer for a specific purpose, viz., to measure the effects of his own teaching and of methods invented to improve its efficiency. This purpose has been successfully accomplished. For the writer's own purposes the tests yield results which are satisfactory and which have fully justified the time and effort given to the testing work. Further, the returns received from other schools to which the tests were sold on the co-operative basis have yielded information which has proved of the highest professional interest and value to

him. Moreover, the tests have given satisfactory service in the hands of so many professors and students of education that their value as tools for educational research is well established. But whether or not either the method or the tests are of value to superintendents and teachers generally is quite a different question.

Accordingly, at the request of the chairman of the Committee on Standards and Tests of Efficiency, an investigation of this question was undertaken. The following letter was sent to 200 superintendents in 30 states, all of whom had recently purchased copies of the Series B Arithmetic Tests:

DEAR SIR:

I am in receipt of a request from the Committee on Standards of the N.E.A. asking for the conclusions of superintendents as to whether or not the use of the Courtis Standard Tests in Arithmetic has been of any value to them or to their teachers from the standpoint of school administration or teaching. Any statement that you may be willing to send me will be forwarded to the committee.

Thanking you for such assistance as you may be willing to give, I am,

Yours very truly,

S. A. COURTIS

At this writing replies have been received from 87 superintendents in 30 states and they are still coming in. The states represented are Alabama, California, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

The general tone of these letters is remarkable for its enthusiastic commendation of the value of measurement to superintendents, teachers, and pupils. Such expressions as "Delighted with results," "Should not like to do without them," "Do more than anything else we have ever tried," or their equivalents, occur in the majority of the letters. Seven of the eighty-seven stated that their results have not been tabulated because of lack of time. Only two express dissatisfaction. The following letter represents the extreme of unfavorable comment:

Replying to yours of the 29th ultimo, I regret to say that I have not discovered any material benefit from the Courtis tests as we applied them last year.

If one had a large amount of statistical assistance they might be worth while, but as a superintendent with a limited force I question their value.

Yours sincerely,

[The name is omitted for obvious reasons.]

On the other hand, many of the other letters show a careful study of the problem and a thorough analysis and formulation of the benefits. The following letter is an illustration:

BURLINGTON, IOWA, October 4, 1915

Mr. S. A. Courtis
82 Eliot Street
Detroit, Mich.

DEAR SIR: The Courtis Standard Tests in Arithmetic have been of great value to me in indicating:

I. The school or schools in which there is a regular increase in ability of the pupils in the fundamentals of arithmetic. Such knowledge has enabled me to suggest to the principals in those buildings where there is no such regular increase in ability of the pupils methods of bettering the product of their teaching.

II. The room or grade in which there has been no increase in ability during the semester. This indicates in some measure the work which the teacher is doing. It affords the superintendent an excellent basis for discussing in detail with the teacher the faults or good points in her work.

III. The school or grades in which there is a tendency to emphasize the work of the fundamentals beyond what is reasonable. Teachers like to do what they can do well. Their interest in those subjects which they like sometimes carries them too far.

From the statements made to me by teachers and principals I am confident that the tests have *not produced* as good results as they should, but this is not the fault of the tests. As the teachers come to understand the purpose of the tests, the value of this work becomes more and more apparent to all.

I do not think that we care to give up the tests under any circumstances.

Yours very truly,

W. L. HANSON, *Superintendent*

It is to be regretted that space prevents quotations from many others. Replies were tabulated, as follows:

Replies

Total replies received	87	Tabulations not completed	7
Unfavorable	2	Favorable	78

Benefits Mentioned

General answers only	17	Reveal needs of individuals	23
Comparison with other cities	14	Stimulate teachers	23
Comparison from grade to grade	7	Stimulate pupils	17
Reveal weak points in school work	11	Furnish standards	24
Reveal weak teachers	13	Furnish incentive or motive	16

The results do not lend themselves to statistical tabulation, owing to the variation in the forms used in expressing the same ideas. Other important uses appearing in these letters are "Measurement of the efficiency of various methods," "Measurement of the progress of individual children," "Value in grading," "Awakening of spirit of investigation among teachers," "Satisfaction of parents."

The conclusions to be drawn from the foregoing data are that for the most part the superintendents who applied for standard tests are making legitimate use of them for purposes of supervision; that these men value the comparison from city to city—made possible by uniform tests and conditions—as a check upon the main character of the work done in their own systems; that the use of standard tests results in the setting up of objective standards which affect the work of teachers and pupils favorably, both by making clear the goal to be attained and by furnishing motives for individual effort; that the tests are of great value in the determination of the needs of individual children and in the adjustment of school work in arithmetic to such needs; that the tests have some value, the amount of which is yet to be determined, in the judging of the efficiency of teachers and in determining the grades of children; that few superintendents are making use of the tests in a scientific study of the comparative efficiency of different methods of teaching.

The rapid increase in the number of tests that have been used each year is, therefore, probably due more to the value of the results secured than to mere curiosity in a passing fad. The use of standard tests for purposes of supervisory control under such conditions is sure eventually to have profound influence upon the teaching of arithmetic.

The writer is glad to have this chance to express his appreciation of the co-operation of the many school workers who have made this extensive experimental use of the research material possible. The financial burden and office labor of carrying on, without profit, a co-operative

venture totaling some $5,000 or $6,000 a year has not been light; neither has the labor of tabulation of returns. It is therefore gratifying to find that this work has been of real value to many superintendents, and the result of the investigations made for the committee will be to stimulate further efforts to secure standards of teaching efficiency and to extend the range of the testing material.

VALIDITY OF STANDARD SCORES

The first tests in arithmetic were issued in 1911 and distributed widely in an attempt to secure standards for use in the writer's own classes. The first tabulation of the returns obtained was in June, 1911, and every year since that date additional tabulations have been made. Series B tests were issued at the beginning of the year 1913–14, and standards based upon the first tabulations were issued in February, 1914. At this time, however, both the tests and the method had reached a stage of development which made possible effective work, so that no change in standards has been necessary since that time, although tabulations of larger and larger numbers of scores have been repeatedly made. The standard scores set for Series B are as shown in Table I.

TABLE I

STANDARD (JUNE) SCORES. SERIES B TESTS

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
III	3	4	3	2
IV	5	6	5	4
V	7	8	7	6
VI	9	10	9	8
VII	11	11	10	10
VIII	12	12	11	11

Standard accuracy = 100 per cent.

The scores given in Table I represent approximately the median speed of work for the different grades and are based upon returns that are nearly nation-wide in scope. The range of variation in schools in different cities and states is approximately four examples above and below the median; i.e., in some school systems the median eighth-grade scores will rise as high as 16 examples in addition and others go as low

as 8 examples. Not more than five eighth-grade classes per hundred will exceed these limits, except as very peculiar and special conditions prevail. On the other hand, the range of speed of work in individuals varies from a score of but two or three examples to scores of twenty-four examples, the limit of the test.

The conditions from city to city do not show greater variation in achievement than are to be found in any one city, such as Boston or Detroit, where there is a large number of classes of the same grade. If returns from small cities or country schools only were tabulated, the median scores for any given grade would probably tend to be somewhat lower. The large-city school apparently emphasizes the drill work. The problem of setting of an adequate standard is, therefore, a difficult one. Any standard adopted must take into consideration the effect of a number of different factors. All things considered, it has seemed best to take as a standard of speed the median speed derived from tabulations of all types of systems. There should certainly be no attempt to press training in addition, for instance, to very high levels of ability at the expense of more important work, and very few school men are willing to neglect in any way training in such fundamental abilities as the four operations. Median *speed*, determined from a wide range of conditions, probably represents the optimal speed at which children can work. A trial in the classroom of such speeds as standards has yielded satisfactory results.

The question of standards of *accuracy*, however, is a much more difficult one to settle, because less information is available and there is more room for a play of personal opinion. The writer has as yet reached no conclusion in the matter, but is endeavoring to determine the degree of accuracy which it is practical to attain under classroom conditions. For this purpose it is necessary to set before teachers as a goal to be reached the highest ideals possible—i.e., 100 per cent accuracy—then to determine in terms of the percentage of the class reaching this goal the degree of success which it is possible to attain. For instance, the average percentage of children of the eighth grade who show median speed with 100 per cent accuracy in first draft work is between 5 and 10 per cent. Experiment proves, however, that it is easily possible to raise the group showing perfect accuracy to 20 or 30 per cent of the class membership and markedly to increase the number of children working with accuracies of 90 and 80 per cent. There is even reason to

expect that with proper methods of training and by employing standards throughout the whole school system, and without change in the time given to arithmetic, it will be possible eventually to secure perfect accuracy in from 60 to 75 per cent of the children. For the classes under his immediate control the writer prefers to keep the standards of median speed and 100 per cent accuracy as the goals to be attained. He recognizes clearly, however, that at present this choice of standards must rest upon personal convictions only, and school men should feel free to change these standards to suit their own opinions.

There are, however, certain facts, other than the achievements of the pupils themselves, which ought to be considered in the determining of standards. One of these is the social value of the abilities developed by school work. The writer has attempted to answer this question by the measurement of as many adults as possible.

The first attempt along this line was made in connection with a survey of the New York schools for the Committee on School Inquiry. Through the kindness and co-operation of Mr. W. D. Ernest, chief of Cadet Staff and member of the John Wanamaker New York Commercial Institute, the consent of Mr. Lynn, general manager of the John Wanamaker department store, New York City, was secured to the testing of 50 employees of the company. This group was tested precisely as if it had been a class of children in school. It met in one of the company's schoolrooms and was tested by one of the force of trained examiners used in the New York survey. Exactly the same tests and time allowances were used as for the children and the same procedure in conducting the examination and in scoring and tabulating the papers was followed throughout. Forty-one complete records were obtained. The subjects represented six different types of positions in the store and in numbers were as follows:

Auditing department	5	Salesmen	7
Billing clerks	5	Typists	3
Cashiers	8		
Clerks	13	Total	41

Two of the clerks and six of the sales people were men. The average age of the group was approximately nineteen years, ranging from fifteen to thirty years. The average term of service for the company, except for the group from the auditing department, was a little more than two years, ranging from two months to five years. The girls from the auditing

department are the product of the store's own training and the term of service for them ranged from eight to fourteen years. The wage paid any member of the group is determined by position and term of service, not by position alone. The amount ranged from five to fifteen dollars per week. Of thirty-six who reported the last grade attended in public school, seven

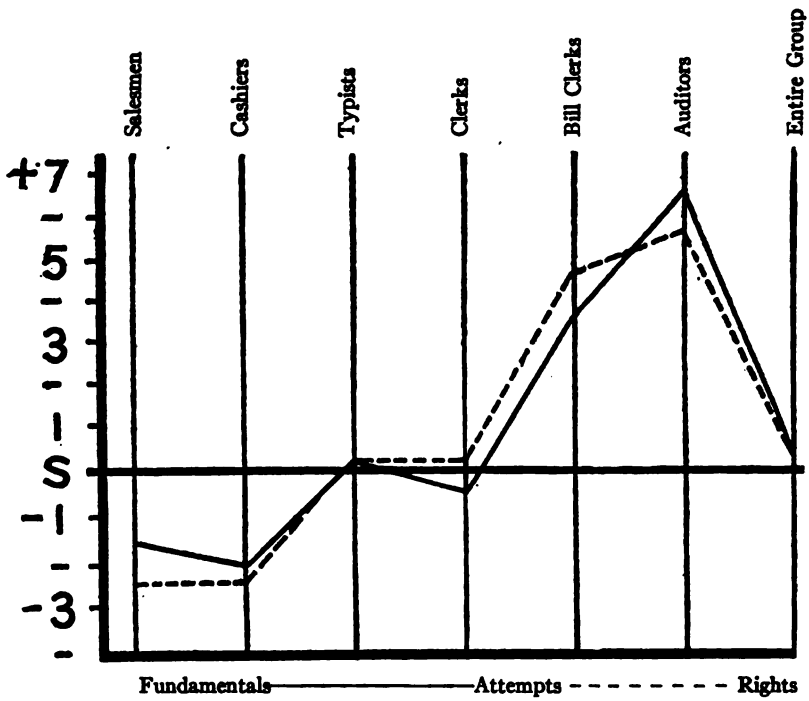

CHART I.—Line marked S indicates eighth-grade standard. Scale at left shows deviations above and below standard.

gave high school, thirteen had completed the elementary grades, and sixteen were in either the seventh or the eighth grade of the grammar school when they left.

It was not possible to attempt more than a general study of the work of the different groups. The cashiers do little more than make change; the clerks and salesmen have a little computation work in the handling of sales slips, store records, etc.; the members of the auditing department have a larger amount of abstract work and it is routine in

character. The auditing department and, to a lesser extent, the billing clerks are thus the only positions in which arithmetical ability would have more than a slight influence in determining the fitness of the applicant.

The tests used were Series A, and in Table II the results are given for Test 7 only, a test in the four operations with whole numbers. The scores given in this test do not differ markedly from those of Series B; the eighth-grade standard score is about 2½ examples higher. The results of the tests are given in Table II and shown in the graph (Chart I; see p. 98).

TABLE II

PART B. AVERAGE SCORES

Position	Attempts	Rights
Salesmen	12.9	7.7
Cashiers	12.4	7.7
Typists	14.7	9.7
Clerks	14.1	9.7
Bill clerks	17.8*	14.6*
Auditors	21.0*	15.4*
Entire group	14.4	10.4

* Computed scores. Entire tests finished in less than time allowed.

It will be noted that the scores of salesmen and cashiers fall below the eighth-grade standards (14.4 examples attempted, 10 examples right); those of the typists and clerks are almost exactly at standard; and those of the billing clerks and of the auditing department run considerably above standard. Two members from the auditing department had very high scores; the best one finished the test in so short a time that had enough material been furnished to keep her busy during the whole time allowed, her score would have been 38 attempted and 34 right.

Before commenting on these results, however, similar results from other sources will be presented. Through the co-operation of Miss Adelaide Baylor, clerk of the Board of Education for the state of Indiana, and the kindness of Mr. Jesse Moore, president of the Columbia School Supply Company, tests were given to a group of 66 factory laborers. These workmen were of three classes: a group of 20, mostly colored men, represented the cheapest labor employed in the factory, average

wage 10 to 12 cents per hour; a second group of 26 men represented the median wage in the factory, average 17.6 cents an hour; a third type represented the best labor in the factory outside of the office, average wage 21 cents an hour. Tests were also given to a group of 13 saleswomen, ranging in age from nineteen to thirty-six. The average score made by these four groups of employees is shown in Table III.

Through the kindness of personal friends and the co-operation of Mr. Boyd Fisher, secretary of the Executive Club of the Detroit Board of Commerce, additional records have been secured from various types of adults. It is difficult, however, to obtain complete data in such cases, as information in regard to either age, salary, or occupation is likely to be missing. However, in Table III will be found the records of a group of low-wage girls ranging in age from eighteen to twenty-five, with average pay of $400 per year; 3 stenographers, age eighteen; 5 adult women, ranging in age from thirty-seven to forty-six, who give their occupation as housewife; a group of high-wage women ranging in age from twenty-one to forty and in salary from $700 to $1,200 per year; 14 boys and men representing machinists, steam-fitters, bookkeepers, railway foremen, railway clerks, trimmers, and salesmen, ranging in age from nineteen to forty-four and in salary from $350 to $900 a year; a group of 7 high-priced men of independent means, ranging from thirty-seven to fifty-nine years of age; a group of 44 Iowa superintendents, ranging in salary from $800 to $4,500, and a similar group of Michigan superintendents, all about thirty-five years of age, and ranging in salary from $600 to $3,600; a group of 17 office employees of an automobile company in Detroit, ranging in age from eighteen to thirty-two, and in salary from $700 to $1,500 per year; a group of 28 employees of the City Gas Company, ranging in salary from $300 to $5,000 per year; a group of approximately 80 teachers, mostly women, attending the summer school of the George Peabody College for Teachers, ranging in age from twenty to forty-five. In Table IV, the individual scores of one of the groups are given in full.

It is evident from these tables that there is an apparent correlation between the earning capacity of adults and their scores, but whether this is a causal relation or not is another question. The fact that a man attains a high position in society is more likely to be due to the superior quality of his general abilities than to his ability in arithmetic alone. An able individual will profit more by school training than one less gifted,

TABLE III

SCORES IN SERIES B TESTS MADE BY VARIOUS GROUPS OF ADULTS

OCCUPATION	NUMBER OF INDIVIDUALS	AGE	WAGES	ADDITION			SUBTRACTION			MULTIPLICATION			DIVISION		
				Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent
Columbia School Supply Co.:															
Laborers	20	.....	10–12 cents	2.9	.9	31	2.9	.9	31	1.7	.3	17	1.0	.4	40
Laborers	28	.....	12–37½ cents	6.6	4.0	61	5.0	2.6	52	4.8	2.0	42	2.7	1.1	41
Laborers	20	.....	21 cents	8.0	4.8	60	5.7	5.0	87	6.0	3.8	63	3.8	2.6	71
Low-wage girls	5	18–25	$ 400	11.4	8.9	78	14.4	12.6	87	10.0	6.8	68	10.2	8.8	86
Stenographers	3	18	.....	12.0	9.0	75	17.3	12.7	73	12.7	9.0	71	14.0	12.0	86
Housewives	5	37–46	.....	12.4	9.8	79	13.0	11.4	88	9.0	6.8	76	9.2	7.0	76
Teachers attending George Peabody School for Teachers (summer)	.....	20–45	.....	12.7	9.5	75	16.2	12.8	79	11.7	9.5	81	14.6	13.9	95
High-wage women	4	21–40	$700–$1,200	14.2	11.5	81	23.2	18.2	78	15.5	13.7	88	16.7	16.0	96
Saleswomen	12	19–36	.....	14.8	12.0	81	11.9	8.8	74	10.0	6.4	64	8.1	6.0	74
Office employees, Automobile Co.	17	18–32	$700–$1,500	18.7	15.2	81	19.2	16.6	86	16.0	12.9	81	16.4	15.5	95
Miscellaneous	14	19–44	$350–$ 900	16.2	13.3	83	15.4	14.1	91	12.0	9.3	77	9.8	8.6	88
Iowa superintendents	44	.....	$800–$4,500	16.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan superintendents	35	.....	$600–$3,600	.....	.....	.....	.....	.....	.....	15.0	11.8	79	.....	.....	.....
High-wage men of independent means	7	.....	.....	19.1	17.0	89	18.6	15.6	84	12.3	10.7	87	10.3	9.7	94
City Gas Co	28	.....	$300–$5,000	21.0	18.0	86	18.0	15.5	86	16.5	13.0	79	16.0	13.2	82

as Thorndike has shown. Nevertheless, the fact remains that individuals who occupy positions of large earning capacity have greater ability in the four operations than those of less earning capacity.

TABLE IV

INDIVIDUAL SCORES: OFFICE FORCE—AUTOMOBILE COMPANY

MONTHLY SALARY	AGE	DEPARTMENT	TEST NO. 1		TEST NO. 2		TEST NO. 3		TEST NO. 4	
			Attempts	Rights	Attempts	Rights	Attempts	Rights	Attempts	Rights
$24.00	14	Office boy	.....	.....	.....	.....	13	6	11	8
60.00	18	Estimating	21	19	23	20	21	18	17	13
65.00	21	Drafting	10	2	9	9	11	7	5	3
65.00	22	Estimating	18	13	22	16	16	14	23	23
65.00	21	Engineering	16	14	18	17	16	13	17	17
65.00	21	Estimating	10	5	10	6	7	3	12	10
70.00	26	Order	16	14	14	13	14	10	12	12
70.00	24	Estimating	24	23	24	24	24	22	24	24
70.00	24	Estimating	18	11	17	14	12	10	16	16
75.00	24	Drafting	12	5	16	9	15	8	15	14
75.00	27	Timekeeper	24	22	24	19	19	17	12	11
75.00	25	Cost clerk	19	14	20	16	12	10	12	12
75.00	23	.....	15	12	22	20	14	12	19	19
80.00	23	Cost clerk	24	23	22	20	19	19	24	24
85.00	24	Timekeeper	24	21	23	21	20	17	24	23
90.00	27	Bookkeeper	24	24	20	19	14	10	12	11
125.00	32	Accountant	24	21	24	22	24	23	24	24
Total			299	243	308	265	271	219	279	264
Average			18.7	15.2	19.2	16.6	16.0	12.9	16.4	15.5

The figures in the tables give some indication of the levels of ability to which it is wise to develop such skills in children; for it must be remembered that one of the functions of the elementary school is to equip children with the essential tools for their life-work. The elementary school is not at all concerned with vocational training. If a boy wishes to become an accountant, the development of additional degrees of skill in the four operations must be the work of the vocational school; for the elementary school is concerned only with the development of skill necessary to meet the demands of an average life.

The figures in the tables show that the level of ability represented by scores of 17 examples[1] would be adequate for the general demands of a

[1] See Chart II.

successful life. Tabulations of the actual scores of eighth-grade children, as has been mentioned above, indicate a median speed of 12 examples. Considering the changes in speed of work which take place from the fourteenth to the twenty-fourth year, owing to maturity alone, it is possible to say that 12 examples represent an adequate speed for the eighth grade. The records of adults so far tabulated thus tend to confirm the standards previously adopted as being suitable goals for the elementary grades.

For those who accept the reasoning in the foregoing paragraphs an important decision will need to be made at once. At the present time 50 per cent of the children already equal or exceed the speed suggested as standard, 12 examples in addition. Also 50 per cent of the children fall below this speed. It is evident that many children in the grades now require additional training to develop adequate speed and it is equally true that a very large number of children have already greatly exceeded adult skill. For instance, in the report of the survey of the school system of Salt Lake City, Utah, in addition 4 per cent of the eighth-grade children equaled or exceeded 16 examples and 27 per cent exceeded 12 examples. If a speed of 12 examples is adequate for the demands of life, then it is a waste of time to give the children additional work tending to develop their skill beyond this point; yet where 75 per cent of the children need such drill to a greater or less degree it is evident that there must be a large element of waste in any form of class training in addition. The adoption of standards carries with it the idea of limitation of the direct training to the standard adopted. For those who adopt the limitation of training as an educational principle new class methods must be devised which permit of the elimination of individuals from the drill classes as soon as the standards have been reached and the setting of the child's time free for more profitable work.

In this connection it is interesting to note that skill in certain individuals may develop almost without limit under additional training. Certain adults have finished the Addition Test No. 1, Series B, in a time interval which represents scores of 60 to 70 examples with nearly perfect accuracy in the standard time limit. The scores of certain eighth-grade classes in schools which give an excessive amount of drill show correspondingly high results for children fourteen years of age. As the standard is raised above 12 examples, however, it requires an increasing effort to reach the higher levels. Moreover, a sorting on the basis of salary

of the various scores made by men tends to show that after a certain critical level is reached additional degrees of skill do not necessarily mean greater earning power. In the graph shown in Chart II, for instance, the two axes represent scores in addition (number of examples attempted, Test 1, Series B) and annual salary. The various cross-marks represent the scores and salaries of individual adults. The circles

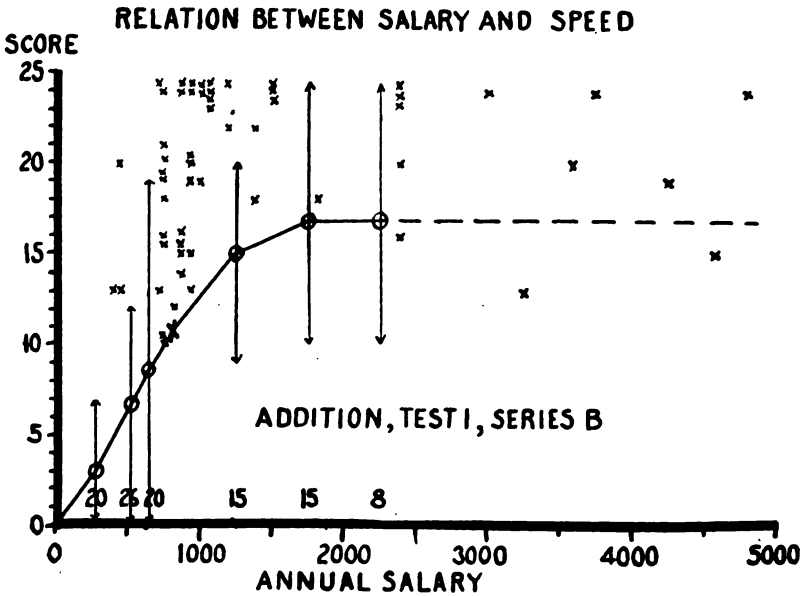

CHART II

on the curve represent the median scores of homogeneous groups of workers—first three, laborers; the last three, Iowa superintendents. The arrows show the range within the groups tabulated and the figures along the base of the graph represent the number of individuals in each group.

It will be seen from the graph that the curve tends to approach a maximum of 17 examples from a salary of $1,800 and up. It is to be noted, also, that even in the lower ranges of salary there are individuals of very high scores. The writer interprets the results shown to mean that in a general way earning capacity increases with ability to add, up to the critical value, and that beyond this limit additional skill has

relatively no effect upon earning capacity. Perhaps a better form of statement would be that the time soon arrives in a man's life when ability to add ceases to be a determining factor in his social efficiency. On the lower levels of general ability, ability to add may have more determining force than on the higher levels. All these considerations seem to point to limitation of training as a desirable procedure in the grades, and the general adoption of the scores recommended as standard with the consequent elimination from the drill classes of all individuals who reach this standard would undoubtedly improve the efficiency of teaching.

Standards of speed, however, are of little value in themselves, as the quality of work must also be considered. The results given in Table II throw some light upon a problem of accuracy also. There is apparent correlation between earning power and accuracy, and the levels of accuracy for the more capable groups range from 75 to 95 per cent, depending somewhat upon the operation. Children who attain fixed habits which enable them in straight-ahead work to maintain an accuracy of 85 per cent will probably be able to hold any position which is open to them. It is also probable that the final standard of accuracy adopted will be less than 100 per cent; but, as stated above, the writer is not yet willing to make a final statement in regard to such standards.

EFFICIENCY

With the adoption of definite standards for speed and accuracy efficiency may be defined in terms as rigid as those used in physical science. The efficiency of any test is the percentage of the total class membership which is able to work at standard speed with standard accuracy. Thus, if 12 examples in 8 minutes and 100 per cent accuracy be taken as standard scores, and if in a class of 40 there are 8 children able to equal or exceed these scores, the efficiency of the teaching would be represented by 8/40, or 20 per cent. The average efficiency of present-day teaching of addition ranges from 5 to 10 per cent if figured on this basis. If figured on the basis of a lower standard of accuracy (see standards adopted by Boston) the efficiency is, of course, largely increased. If standard tests are given at the beginning and the close of the year the efficiency of the teaching effort for the year would be represented by the difference between the initial and final efficiencies.

Such a definition of efficiency is, of course, open to the objection of unequal units, since to raise one child to standard scores may not be at

all equal to raising another child of very different initial abilities to the same scores. However, in any unselected class of 20 children the range of individual abilities will be so great that the objection of unequal units is of no practical significance. Further, it should be most carefully noted that efficiency, as here defined, is simply a measure of how completely the goals set as standards have been attained; it is not at all a measure of the movement within the class toward these goals. It is probable that a measure of this latter quantity is also needed. For the immediate problem for the future is the determination of standards of teaching efficiency in terms of objective scores for speed, accuracy, and amount of time given to the subject.

CHAPTER IX

USE OF STANDARD TESTS AT SALT LAKE CITY, UTAH

ELLWOOD P. CUBBERLEY
Professor of Education, Leland Stanford Junior University

In May, 1915, a survey of the public-school system of Salt Lake City, Utah, was conducted by a corps of five workers, of which I was director. One of the problems presented at Salt Lake City was that of estimating the efficiency of the instruction given. This was made especially important by reason of the fact that there had been much criticism in the city, on the part of the business men, of the instruction in the so-called fundamental subjects in the schools.

Accordingly, the survey force undertook to measure the instruction in writing, spelling, composition, arithmetic, and reading in the elementary schools of the city. For this purpose nineteen of the thirty schools were selected, with due care to touch every type of community from the standpoint of population, social and economic status, and general school conditions. The tests were used with the "B" or upper classes of each grade only. The tests used were those standard tests which have been employed in a number of other cities, and the methods used in giving and scoring the tests were as nearly as possible the same as in other cities, so as to get as nearly as possible comparable results.

1. *Spelling.*—The test in spelling was made by using the ten words selected by Dr. Leonard P. Ayres and used in the Springfield survey. The list of words was pronounced to the children by the regular classroom teachers in the presence of a member of the survey staff, and ordinary classroom procedure was followed with reference to such matters as writing, pronouncing words of more than one meaning, etc. The papers were then collected, immediately scored by the teacher, and turned over to the member of the survey staff who was present.

The results of the test showed that both by grades and for the city as a whole the spelling in Salt Lake City was particularly good. The average for the city as a whole was 86.0, as against an expectancy of 70.0. Individual schools averaged as high as 93.0, while the lowest

was 77.2. A more detailed examination of the results, however, showed large variations between rooms and among individuals within rooms. This is commented on at some length in the survey report. The general conclusions are that the test itself was entirely too easy, that for 40 per cent of the children it was no test at all, and that the city is obtaining a degree of efficiency in spelling beyond what might reasonably be expected of the schools. An examination of the time schedule also showed that the efficiency was obtained by an expenditure of time completely beyond what might reasonably be expected of a school system.

2. *Composition.*—For this test a brief composition was devised, similar to that which had been used at Butte and elsewhere, and the children were asked to express themselves on paper. The test was made in Grades IV–VIII inclusive. The scoring was done in terms of the Hillegas scale, not because this scale is itself a perfect one, but because it had been used in a number of other cities, and by using it comparable results from elsewhere could be set up beside the Salt Lake City results.

The general result of the test showed that the children were well qualified for language work, viewed as groups, but that individual children showed wide variations in their ability to use English. The variations were so wide that it was evident that the ordinary composition work could not be conducted in the schools without making it far too easy for some and far too difficult for others. The composition work did show some marked evidence of imagination and free expression, and the results, compared with those in other cities, showed that Salt Lake City stood well in the composition tests. It was clear from the results, however, that a better classification of the pupils within the grades would result in better composition work.

3. *Writing.*—Samples of the ordinary writing of the children in Grades III–VIII were taken, and these were scored by the Thorndike scale. The results of the test showed again that Salt Lake City ranks high compared with school systems where the test had been used, that the writing work was well up to the standard, and that the time involved was not unreasonably long. Median samples of the writing in each grade were reproduced in the report with the view to showing that the writing of the children in the schools did not offer the basis for the criticism of the school writing which the business men were wont to express.

4. *Reading.*—The new Courtis reading tests were used in testing the quality and quantity of the reading in a number of the schools, and these were supplemented by a number of personal judgments on the quality of the reading. While the reading test is recent and has not as yet been perfectly worked out, so that the members of the survey did not feel that the results were particularly valuable, yet the showing which the Salt Lake City schools made, indicated that the city ranked well in point of ability to read rapidly and remember what was read.

5. *Arithmetic.*—Two types of tests were made in arithmetic. For the first the Courtis standard tests in addition, subtraction, multiplication, and division were used, and the scoring was done in the manner provided for in the Courtis tests. The second test in arithmetic was one in reasoning, and for this the Stone reasoning tests were used. Compared with a number of other cities in which these same tests have been used, the schools of Salt Lake City stood high in the four fundamental operations. The city also stood well in the reasoning tests. Detailed tables and graphs were presented in the report to show the results by grades and by schools.

SUMMARY AND RECOMMENDATIONS

Sixty pages in the survey report are devoted to a detailed description of the tests made, and twenty-one tables and twelve drawings further illustrate the results. An attempt was made to draw from the results as shown certain conclusions and recommendations which would help the administrative authorities in the improvement of the schools. While one needs to read the entire chapter to get the full meaning of the conclusions and recommendations made, these may, nevertheless, be summarized as follows:

Conclusions.—1. Salt Lake City ranks high among cities of her class in each of the five studies in which tests were given.

2. In spelling, so large a percentage of children made a perfect score that full interpretation of the results is difficult. The city's average standing was 16 per cent above the standard.

3. In spelling, language, writing, and in the fundamentals of arithmetic, wide differences exist between the results shown for different schools.

4. The differences between grades are, with few exceptions, approximately what they should be.

5. The range of abilities in any given grade is entirely too great, as judged by all five of the tests.

6. Similarly, the range of abilities within a given class, again in all subjects tested, is far too great.

7. At least one-fourth more time is being given to spelling, and more than one-fourth more to arithmetic, than is justified in the light of the best knowledge on the subject.

Recommendations.—1. Spelling should not have more than 60 to 75 minutes per week, and arithmetic from 75 minutes in Grade II to 200 minutes in Grade VIII. A part of the surplus time from these two branches should be given to language work and part to other parts of the curriculum than the subjects dealt with here.

2. The only economical and pedagogical way of meeting the needs of the extremely dull and extremely bright pupils (perhaps from 4 to 10 per cent of each school class tested) is by a much larger use of ungraded rooms, to which the most skilful teachers should be assigned. It would be easy for all the larger schools of the city to find from 25 to 50 children who ought, for their own sakes and for the sakes of other children as well, to be placed in such rooms. This would provide an inestimable relief in all class work in the school. This is the most evident and the most important need which is brought to light by these tests.

3. The best and most constant supervision of this work is needed to secure the necessary readjustments. It should be added that, so long as the grade lines are stiffly maintained as the only basis for the classification of children, part of the value of expert supervision is nullified.

4. In addition to this, promotion by subjects ought to be a possibility more frequently made use of. When a fourth-grade child can read as well as a seventh-grade child he ought not to be kept in the fourth grade for reading just because he cannot leave his fourth-grade arithmetic.

5. Briefly, what the schools have achieved in general, they should now set themselves to achieve in particular.

CHAPTER X

READING

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Progress in the study of reading has been made since the report of this committee in 1915 chiefly through the opportunity supplied by the Cleveland survey to apply on a large scale the methods developed in previous studies. The Cleveland tests in reading fall into two fairly distinct groups. The first group was made with exercises selected from the readers commonly employed in the grades. In this group of tests the teachers of the whole city participated. The results show with clearness that teachers can conduct productive studies if a little supervision is provided, and that results secured by general studies of this type can be directly applied to ordinary school work. The second group of reading tests carried on in the Cleveland survey was made with standardized selections and demonstrates that a satisfactory degree of exactness can be attained even in so complex a subject as reading and that the methods of instruction in reading, especially in the upper grades, are in need of radical improvement.

The first tests in which all the teachers participated are described in the following directions sent to the teachers:

TESTS OF READING—CLEVELAND FOUNDATION SURVEY (May, 1915)

In order to make a study of reading, it is necessary to secure certain facts which are not ordinarily noted in everyday classroom work. Special methods will have to be adopted in order to secure these facts, but it is a fundamental mistake to think of these special recording methods as opposed in any way to the ordinary routine of classwork, or to think of them as replacing for either pupils or teacher the regular instruction. A recording device is good just in the degree in which it fits into the regular work and at the same time gives a series of accurate results on the particular point on which information is sought.

Rates of Reading.—All reading proceeds at some rate. Children in the same class differ in their rate of reading; children change in their rate of reading

as they go up through the school. It is desirable that we get some exact facts about these different rates, because rate is in itself important, because we find that rate and ability to understand are interdependent, and because rate is one of the symptoms by which we can readily measure the stage of development of the pupil.

Interpretation and reproduction.—Again, the power to reproduce is cultivated in all reading exercises. This power differs greatly in different children, and is affected by the kind of ideas presented in the reading matter. It is a more difficult problem to find out how much children understand and are able to reproduce than to determine the rate of reading, but we must carry our investigation far enough to determine, by studies of the power to reproduce, how far the teaching has been effective in cultivating the child's understanding.

Measurement as related to instruction.—Measurements of speed and power of interpretation will be worth collecting only when such measurements bring out the normal facts which are always present, but are for the most part unrecorded in reading exercises. Whenever asked to measure speed or power of interpretation, the teacher should be sure first of all that the process of measuring does not change the character of the exercise as a real class exercise. Have a normal lesson. Be sure in every case that the pupils get out of the exercise just as much instruction as though no recording of facts were going on, and follow the reading with the most productive instruction that can be given.

Learning to record facts.—The recording of facts presents certain difficulties. Usually a person who tries to record facts for the first time finds that he is distracted and inaccurate. The first principle which has to be laid down as applicable to all this work is therefore the following: Repeat each recording exercise several times until it becomes easy. Do not be discouraged if the record made the first time does not seem to go well. Furthermore, do not throw away the first record. It is worth keeping for purposes of comparison.

Uniform survey of reading.—This survey will aim to find out as much as possible about reading in the Cleveland schools. In order to make comparison easy the reading matter to be used for the final records of each type will be taken from the Jones Readers, which are in every school.

Teachers are urged to try the tests with other passages than these designated for use in all schools. The more frequently the test can be made with various kinds of material, the better prepared will the teachers be to make the final uniform test. Records should be kept of all tests made. The prescribed passages from the Jones Readers should be used on a given day in each building after sufficient preliminary practice to insure that the teachers know how to make the tests.

Throughout the preliminary practice and the final uniform test every reading exercise should be made a part of the regular instruction of the class.

Measuring the rate of oral reading.—The simplest measurement under the ordinary conditions of class work is probably a measurement of the rate of oral reading. This record can be made in any ordinary reading exercise. Do not let the children know that measuring is going on. Have them read as usual, but let the teacher have a watch and a pencil at hand. When a child begins to read, record his name and note the second at which he starts the paragraph. At the end of one minute put a mark in the book showing how much the child read. Let him read on without interruption to the end of the paragraph, as he would in any reading exercise. Make whatever comments or ask whatever questions would be asked in an ordinary reading lesson and then go on with a second child. After class count up the lines read by each member of the class in 60 seconds and tabulate the records. It will be found that there are certain differences in rate. Later we shall learn more about each child when we measure his rate of silent reading and when we measure his power of reproduction.

How the survey will use records.—By way of anticipation of the kind of use which will be made at the survey office of these results, it may be pointed out that a comparison will be made of different grades and of the records from various parts of the city. It should be stated explicitly that good reading cannot be judged by speed alone. A very rapid rate of reading in a second grade, for example, would show that the exercise is not a reading exercise at all, but a memory exercise. Too rapid reading in an upper grade would show lack of clear enunciation. No second grade and no eighth grade should stand out of its class, either above or below. It is possible, therefore, through a general comparative study to check up any single set of figures by the general results. If a single set of figures is to be useful, it should reflect the facts faithfully. Good records are faithful records, not exceptional records.

It may be appropriate to remark in this connection that these records are not to be used to the advantage or disadvantage of any individual. The value of the reading matter, the stage of development of the children, and many other general factors will be brought out by this broad survey. The method will also be useful in directing the efforts of individual teachers. The latter advantage is one which the survey ought to leave behind, but it does not fall within the scope of the survey to pass on individuals.

Measuring the rate of silent reading.—The second measurement is designed to bring out the facts regarding silent reading. All schools use silent reading in the requirement that pupils study geographies and histories, but too often

silent reading is lost sight of as a special problem for the reading-teacher. It may be difficult, because such work has not been emphasized, to have an exercise in silent reading which shall not impress the children as unusual. It is especially urged, therefore, that this part of the study be preceded and followed in every case by some real instruction and questioning. For example, when a passage has been read silently, as will be directed below, let the teacher immediately verify the reports made by various children by asking them about all parts of the passage, especially that which they report that they read last. Repeat the measurement and the questioning with both familiar and unfamiliar matter until the pupils come to realize what a silent-reading exercise really is. Furthermore, do not give any direction such as "repeat each word to yourself carefully," or otherwise try to influence the children to read silently by any fixed or prescribed method.

What is wanted is a clear record of how fast the child reads to himself in a normal way without skipping on the one hand, or without unduly careful looking at each individual word on the other.

It would be possible to take individual records of the rate of silent reading similar to those provided for in the section above on oral tests, but this is probably unnecessary, since the class as a whole can be measured without serious difficulties. Start the class off all together. In order to do this, let the teacher read aloud to the whole class in a normal way some part of the page immediately preceding that which is to be used for the test. When all come to the turning of the page, let the teacher stop reading and note the exact time. Let the children go on in accordance with a prearranged plan, each reading to himself, with the understanding that there are going to be questions asked about what he has read. At the end of a minute have each child close his book and report by reproducing on paper the last line which he read. He will not be able in most cases to report the line in exact form, but the teacher can judge by means of the written record how far the pupil has read. Now have some discussion of the passages so as to make sure that all read what they reported and that they read without skipping. After school, record the number of lines read by each. Try this several times.

A very good exercise for the pupils can be made of the requirement that they count the lines read, but their count should in each case be verified by the written record mentioned above.

Later tests.—Following these two kinds of tests will come others on the power of interpretation of the passages read. The detailed directions for these interpretation tests will be given out later.

Uniform test in oral reading.—After several preliminary tests of oral reading have been made by the methods described, and the results entered on the tabulating sheet, the uniform test should be given. In order that the pupils

of a given grade throughout the city may read the same material, the following selections have been chosen from the Jones Readers for this test:

Grade	Book	Selections	Pages
2A	II	Nathan and the Bear	94–100
		Ruff's First Adventure	118–123
3A	III	Peter Johnson's Boots	57– 60
		Rosamond and the Purple Jar	150–153
4A	IV	Prof. Frog's Lecture	116–126
		Queen Alice	129–136
5A	V	Golden Touch	29– 39
		Moses at the Fair	69– 71
6A	VI	A Gallop of Three	13– 17
		A Hunting of the Deer	47– 53
7A	VII	An Old-Fashioned Snow Storm	63– 66
		A Cellar in Siberia	77– 80
		Charley	20– 24
8A	VII	Surrender of Granada	161–167
		Destruction of Pompeii	176–182

At the conclusion of this test the results should be entered on a new tabulating sheet.

Uniform test in silent reading.—After several preliminary tests of silent reading have been made by the methods described and the results entered on the tabulating sheet, the uniform test should be given. The same tests will be given in each grade throughout the city. They will be taken from the Jones Readers, as follows:

Grade	Book	Preliminary Page	Test Pages
2A	II	101	102–103
3A	III	97	98– 99
4A	IV	61	62– 63
5A	V	47	48– 49
6A	VI	63	64– 66
7A	VII	73	64– 66
8A	VII	247	248–249

At the conclusion of this test the results should be entered on the tabulating sheet for the results of the uniform test in oral reading.

What the measurements show.—Teachers will note in their own results the following facts:

1. Children differ radically.

2. Passages differ in difficulty, but the various children in each class are likely to show fairly uniform relative standings whatever the character of the passages. Especially may it be noted that unfamiliar passages are sometimes easier than familiar passages.

3. The rates of silent and oral reading differ.

The directions as to procedure have been for the most part given in the foregoing discussion. The following details may be added:

In counting, be sure that a line which is shortened by a picture is counted as a part line.

At the end of a paragraph count all lines that are half-lines or more as though they were full lines. If such a line is less than a half-line, neglect it.

Be sure that you test in all cases for recognition of meaning, so that the pupils will not be tempted to skip or make extravagant reports.

Make all tests frequently enough so that you have confidence in your reports.

It is suggested that from the beginning each teacher try some written tests of the power to reproduce passages, so that when that kind of work begins for the survey there will be a clear notion of the precautions which are necessary.

Some of the typical results of these tests may be presented. First, the now well-known difference between the rate of silent reading and the rate of oral reading was brought to the attention of teachers by the results which they obtained. These results are reported in Table I.

TABLE I

NUMBER OF LINES READ ORALLY AND SILENTLY IN ONE MINUTE BY CHILDREN IN THE VARIOUS GRADES OF 43 CLEVELAND SCHOOLS

Grades	Lines Read Orally	Lines Read Silently
II	13	16
III	16	22
IV	14	21
V	15	20
VI	16	24
VII	16	21
VIII	16	21

No effort should be made to compare the results of successive grades with each other, because the length of the lines in different readers is different and the content of the passages is of varying difficulty. Even so, it is evident that children read more rapidly when they are free from the necessity of pronouncing words. The fact that there is not greater difference in the upper grades is undoubtedly due to the fact that school training emphasizes almost exclusively oral reading.

Fuller details of this contrast between oral and silent reading may be seen in Table II, which shows the results in full for the sixth grades of five schools.

Especially significant is the fact that the deviations from the medians are comparatively much smaller in oral reading than in silent reading. This means that children in a given grade are more alike in their abilities to read orally than in their abilities to read silently. This is explained by the fact that the limits of speed in oral reading are determined in part by the limits of the purely physiological process of articulation. All children in the sixth grade approach this physiological limit of speed in articulation. In silent reading, on the other hand, the widest differences are possible. That wide differences do appear is clearly shown by comparing the two columns in Table II marked "median deviation."

TABLE II

NUMBER OF LINES READ PER MINUTE IN THE SIXTH GRADES OF FIVE SCHOOLS

NAME OF SCHOOL	No. of Pupils	Lines Read Orally				Lines Read Silently			
		Lowest Pupil's Record	Highest Pupil's Record	Median Record	Median Deviation	Lowest Pupil's Record	Highest Pupil's Record	Median Record	Median Deviation
Addison.....	16	12	24	19	2.3	21	41	28	5.7
	16	11	23	14	3.2	15	32	21	4.2
Alabama.....	13	10	18	15	1.5	13	29	24	3.2
Bolton.....	35	9	20	16	2.0	8	44	15	9.5
	22	7	19	23	2.2	14	50	37	7.7
Boulevard.....	28	11	19	13	1.5	8	30	19	4.0
Brownell.....	32	6	24	14	3.0	15	55	22	6.0

The second set of tests—that is, the tests which employed, not the common passages from the readers in the hands of the pupils, but a series of selected and standardized passages—represents an advance in technique above the tests made by the whole system. The passages were standardized by Mr. William S. Gray. Without entering into the details of Mr. Gray's method, it may be stated in general terms that passages were selected by teachers and were then graded according to the results obtained after use with children of various school systems and various grades.

It is quite impossible to review in full the results obtained by the use of these standardized passages. Perhaps the most significant single result appeared in the fact that the more rapid the pupil's silent reading,

the higher his ability to reproduce what he has read. Some of the evidence establishing this conclusion is presented in Table III. Three passages were employed in this test, one by Grades II–IV, a second by Grades V and VI, the third by Grades VII and VIII. The table should be read as follows: In the second grade those pupils who read 100 words in from 102 to 98 seconds, inclusive, made an average quality grade of 17. Those who read 100 words in the shorter period from 92 to 88 seconds, inclusive, made an average quality record of 19. The table is based on data from 1,831 pupils in the Cleveland schools. The full significance

TABLE III

TABLE SHOWING RELATION OF SPEED AND QUALITY IN SILENT READING
(Based on data from 1,831 pupils in Cleveland, Ohio)

Grade	100 Words in 100 Seconds or 1 Word per Second	100 Words in 90 Seconds or 1.1 Words per Second	100 Words in 80 Seconds or 1.25 Words per Second	100 Words in 70 Seconds or 1.42 Words per Second	100 Words in 60 Seconds or 1.67 Words per Second	100 Words in 50 Seconds or 2 Words per Second	100 Words in 40 Seconds or 2.5 Words per Second	100 Words in 30 Seconds or 3.3 Words per Second	100 Words in 20 Seconds or 5 Words per Second	100 Words in 16 – Seconds or 6.5 + Words per Second
II.....	17	19	20	23	24	24	25	31	30	36
III.....	19	21	24	29	28	28	30	34	41	28
IV.....	.....	.....	.....	12	15	15	17	22	22	14
V.....	.....	.....	.....	13	20	20	22	26	24	33
VI.....	.....	.....	.....	19	27	28	22	28	30	23
VII.....	.....	.....	.....	.....	10	17	19	20	26	28
VIII.....	.....	.....	.....	.....	.....	19	21	25	29	18

of the table is brought out by reading horizontally along the line of each of the grades. Thus, for the second grade the score for quality improves steadily from 17 to 36 as the speed increases. For the third grade the score for quality improves steadily until the last stage, where there is an exceptional drop. It will be seen that in almost every case increase in speed is paralleled by improvement in quality.

The significance of this result for practical class work is at once apparent. Methods which will promote fluent, rapid reading will contribute in general to clear understanding and increase in power of interpretation.

The foregoing brief account of the results of the Cleveland survey will serve to show something of the character of the methods and outcome of the tests. More significant than any of the figures which can be

set down in tables, however, is the fact that these results can be used to improve the teaching of reading. This practical value of the tests can be made clear by referring to three distinct applications of the results in Cleveland which will be helpful.

First, the teachers are made aware by the tests which they themselves conducted of the importance of cultivating silent reading by methods different from those employed in oral reading exercises. Books on methods are full of advice on the teaching of oral reading, but they pass silent reading with a casual mention. Yet silent reading is the only form of reading commonly employed in later life. Silent reading is necessary for the pupil who studies geography or history or any other subject out of a textbook. It is accordingly important that the distinction be impressed on teachers.

Secondly, the methods of teaching generally employed in the schools tend to make pupils slow in their reading. It is very important that teachers learn from a comparison of their own pupils that those children who learn to be fluent by personal efforts are also the pupils who can reproduce most efficiently what they have read. This fact will serve to check all of the criticism which is sometimes heard against schools which aim to cultivate rapid methods of mental work. Speed is, within reasonable limits, a desirable quality. Speed in silent reading is distinctly a virtue.

Thirdly, there is the broad, general teaching of these tests. They show that exact, quantitative studies are highly useful in directing all kinds of school work. The arithmetic tests which have been so productively worked out by Courtis are accepted by teachers as naturally permitting a high degree of quantitative accuracy. Writing and spelling are thought of as readily reducible to quantitative grades because of their relative simplicity. When, however, exact statements can be made regarding reading, the central subject of the elementary course has been reached, and the value of exact investigations can be demonstrated more fully than in any other subject.

This final outcome is of such importance to schools in general that a chapter of this report has properly been devoted to a paper by a practical superintendent, Mr. Oberholtzer, setting forth his experience in conducting a quantitative study of reading.

CHAPTER XI

STUDIES BY THE BUREAU OF RESEARCH AND EFFICIENCY OF KANSAS CITY, MISSOURI

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While bureaus of educational standards and measurements (research and efficiency) are engaged for the most part in applying to school work the objective measures that have been established, yet these bureaus are not standardized and no two of them are proceeding in the same way. However, many problems are common to all of them. Most of them co-operate with the superintendents of their school systems in the analysis of school statistics (some handling all the school statistics); they direct various forms of educational measurements, tabulate the results, and furnish the summaries and conclusions reached to superintendents, supervisors, or principals, to be used in improving educational practice. They also study the cost of various items of school expenditure and establish standards in school costs; they conduct various forms of school inquiries; they make careful scientific studies of any problem of school supervision or school administration. These bureaus are attacking the herculean task of substituting fact for opinion in school practice. For generations our schools have been conducted along the lines laid down by opinion and precedent. All other forms of business of great magnitude that spend vast sums of money, and affect the welfare of thousands of people, are being organized more and more in accordance with well-established principles, based on fact. Education is the greatest business in which the people are engaged, and this business affects more vitally than any other business the life of every person. It is right, then, that the people should demand of this enormous business enterprise accounts, both educational and financial, as complete, systematic, and accurate as any other business furnishes. The people should know what results they are getting for the vast outlay of money they are making.

During the past year the Bureau of Research and Efficiency of Kansas City has studied the following problems: (1) overageness and

its causes; (2) non-promotion and withdrawals and their causes; (3) opportunity for individual progress in schools; (4) comparative study of school elimination and school persistence for the past twenty-five years; (5) length of time required to complete the elementary-school course; (6) the efficiency of school work in (*a*) spelling, (*b*) handwriting, (*c*) fundamental operations in arithmetic, (*d*) accurate copying; (7) the cost of heating, lighting, water, janitor service, etc.; (8) grading and distribution of grades in the high schools; (9) revision of the reports and records of the school system so as to make them of greater educational significance; (10) exceptional children and their needs; also (11) several minor problems.

The work of the Bureau can best be illustrated by extracts from a few of the studies made. The following is part of a study showing method of attack on cost of heating.

A. COST OF FUEL PER PUPIL IN DAILY ATTENDANCE

The following table gives the 50 largest cities in the United States, arranged in the order of the cost of fuel per pupil in daily attendance during the school year 1912–13:

1.	New Orleans	$0.37	26.	Scranton	1.34
2.	Richmond	0.37	27.	Pittsburgh	1.35
3.	San Francisco	0.40	28.	Fall River	1.40
4.	Nashville	0.46	29.	Boston	1.41
5.	Los Angeles	0.46	30.	St. Paul	1.43
6.	Birmingham	0.48	31.	Providence	1.45
7.	Atlanta	0.58	32.	Minneapolis	1.49
8.	Oakland	0.62	33.	Toledo	1.52
9.	Memphis	0.66	34.	Philadelphia	1.52
10.	Louisville	0.69	35.	Buffalo	1.54
11.	Paterson	0.71	36.	Spokane	1.58
12.	St. Louis	0.80	37.	Jersey City	1.60
13.	Newark	0.83	38.	Columbus	1.61
14.	Baltimore	0.92	39.	Denver	1.67
15.	New York City	0.96	40.	Portland	1.68
16.	Dayton	1.00	41.	Washington	1.70
17.	Bridgeport	1.03	42.	Chicago	1.71
18.	Detroit	1.09	43.	Worcester	1.83
19.	Cleveland	1.12	44.	New Haven	1.84
20.	Seattle	1.21	45.	*Kansas City, Mo.*	*1.96*
21.	Cincinnati	1.22	46.	Omaha	2.10
22.	Milwaukee	1.24	47.	Syracuse	2.11
23.	Cambridge	1.27	48.	Rochester	2.27
24.	Grand Rapids	1.30	49.	Albany	2.37
25.	Indianapolis	1.31	50.	Lowell	2.70

From the foregoing tabulation it is seen that in 1912–13 only five cities in the United States paid more per pupil for fuel than did Kansas City, Missouri, and that only one of these cities was in the Central West. Investigation of coal prices indicates that the prices of coal in Kansas City, Missouri, are relatively high. However, after allowance is made for the higher price of coal, it seems probable that the cost per pupil for fuel in Kansas City, Missouri, is 10–20 per cent higher than in cities that are able to secure coal at about the same prices as are paid in Kansas City. In compiling the foregoing figures, the fuel used in the library building and library branches was deducted before making the averages. No deduction, however, has been made for coal used by janitors. In most cities coal is not furnished the janitors by the school district. The coal used by the janitors should not amount to more than 5 per cent of the bill. Thus it is seen that when allowance is made for the janitors' coal the cost of fuel is still relatively high.

It is fair to Kansas City to note that in recent years this school district has erected a large number of new school buildings, containing large schoolrooms, spacious hallways, gymnasiums, etc. Such buildings equipped with modern ventilating systems and other modern conveniences are necessarily expensive to heat.

COST OF COAL PER PUPIL IN DAILY ATTENDANCE

(Cities in Missouri, Kansas, Nebraska, and Iowa)

	1910–11	1911–12	1912–13	1913–14
MISSOURI				
Springfield	$0.67	$0.78	$0.70	$0.79
Joplin	.....	.79	.73	.76
St. Louis	.81	.87	.80	.76
St. Joseph	.....	1.78	1.83	1.69
Kansas City	1.65	1.81	1.96	1.77
KANSAS				
Kansas City	1.34	1.30	1.48	.....
Topeka	1.45	1.82	1.53	.....
NEBRASKA				
Omaha	.....	1.85	2.09	.....
IOWA				
Council Bluffs	.....	1.06	1.04	.....
Sioux City	.....	1.56	1.53	.....
Davenport	.....	1.71	1.55	.....
Des Moines	.....	1.86	1.72	.....
Cedar Rapids	1.68	2.12	1.49	.....

COST OF COAL PER PUPIL IN DAILY ATTENDANCE IN EACH SCHOOL BUILDING IN KANSAS CITY, MISSOURI

1. Kensington	$0.735	S	40. Wendell Phillips	1.636	H
2. Sixty-first Street	0.783	S	41. Bristol	1.662	H
3. Askew	0.838	S	42. Linwood	1.684	O
4. Milton Moore	0.840	S	43. G. B. Longan	1.686	O
5. Henry C. Kumpf	0.883	S	44. Karnes	1.712	H
6. Irving	0.944	O	45. Penn	1.734	S
7. Shiloh	0.956	S	46. Thacher	1.753	O
8. Jefferson	0.964	H	47. Blenheim	1.80	S
9. Manchester	1.019	S	48. Bruce	1.825	S
10. Woodland	1.023	O	49. Booker Washington	1.861	S
11. Swope	1.024	S	50. Wheatley	1.897	S
12. Hale H. Cook	1.049	S	51. Lykins	1.907	H
13. Emerson	1.058	S	52. Attucks	1.913	H
14. Washington	1.058	O	53. Mount Washington	1.915	H
15. Hamilton	1.101	O	54. Bancroft	1.944	O
16. Scarritt	1.102	O	55. Norman	1.962	O
17. Switzer	1.114	O	56. S. B. Ladd	1.963	H
18. Horace Mann	1.136	O	57. Douglass	1.972	S
19. Benton	1.147	O	58. Garrison	2.084	H
20. Greenwood	1.155	O	59. Adams	2.086	H
21. Frances Willard	1.178	S	60. Webster	2.110	H
22. Troost Avenue	1.184	H	61. Rollins	2.111	O
23. Lincoln	1.203	O	62. Swinney	2.135	S
24. Humboldt	1.212	O	63. Longfellow	2.146	H
25. Morse	1.215	O	64. Blue Valley	2.164	S
26. William Cullen Bryant	1.254	S	65. Jackson	2.204	S
27. Martin	1.277	S	66. Special	2.262	S
28. Whittier	1.311	O	67. Marlborough	2.337	S
29. James	1.323	O	68. Seven Oaks	2.515	S
30. Hyde Park	1.357	O	69. McCoy	2.817	S
31. Fairmount	1.362	S	70. Sumner	2.848	S
32. Lowell	1.384	O	71. Graceland	2.851	S
33. Van Horn	1.409	H	72. Benjamin Harrison	2.896	S
34. Faxon	1.419	O	73. Clay	2.954	H
35. Yeager	1.424	O	74. J. S. Chick	2.980	S
36. Franklin	1.475	H	75. S. O. Allen	3.426	S
37. Ashland	1.480	O	76. E. C. White	3.454	S
38. Allen	1.536	O	77. Lathrop	3.891	H
39. Garfield	1.600	O	78. Madison	4.596	H
Manual Training High	1.905	O	Central High	4.079	O
Westport High	2.251	O	Northeast High	4.904	S
Lincoln High	2.694	O			

O = oil. S = soft coal (bituminous). H = hard coal (anthracite or semi-anthracite).

From the table on p. 122 it is seen that the cost per pupil for coal in Kansas City, Missouri, averages higher than the cost in any other city in

this group of states except the city of Omaha. The average cost is more than 20 per cent greater than in Kansas City, Kansas, more than 10 per cent greater than in Topeka, Kansas, and more than double the cost in St. Louis, Missouri. A large part of this latter difference is accounted for by the fact that St. Louis buys the best grade of Illinois lump coal (bituminous) at a very low rate. This year St. Louis has contracted for its coal at $1.91¾ per ton, whereas Cherokee coal costs the Kansas City school district $3.54 per ton and is not so good a quality of coal as the Illinois lump. While this difference in the price and quality of the coal will account for a large part of the difference in the cost in St. Louis and Kansas City, it does not account for all of it. It would seem from these figures that the cost in Kansas City is from 10 to 20 per cent higher relatively than the cost in St. Louis or than the cost in the neighboring towns in Kansas.

Group I.—The largest group of school buildings is heated by steam hot-blast. There are 28 schools in this group. The lowest cost in this group was $1.102 per pupil in the Scarritt School, and the highest cost was $3.454 per pupil in the E. C. White School. It would seem that it

TWENTY-EIGHT BUILDINGS HEATED BY STEAM HOT-BLAST AND THE COST PER PUPIL

Scarritt	$1.102	Whittier	1.311
Switzer	1.114	James	$1.323
Horace Mann	1.136	Hyde Park	1.357
Benton	1.147	Van Horn	1.409
Greenwood	1.155	Faxon	1.419
Humboldt	1.212	Franklin	1.475
Morse	1.215	Ashland	1.480

		Percentage above Median Cost			Percentage above Median Cost
Allen	$1.536	2	Norman	$1.962	30
Garfield	1.600	6	S. B. Ladd	1.963	30
Linwood	1.684	11	Rollins	2.111	40
G. B. Longan	1.686	11	Benjamin Harrison	2.896	92
Thacher	1.753	16	*Clay	2.954	96
Lykins	1.907	27	E. C. White	3.454	130
Attucks	1.913	27	Median cost	1.508	...
Bancroft	1.944	29			

* Investigation has developed the fact that in this new 18-room building only 11 rooms were occupied, but that all 18 were kept heated all winter. The heat should have been cut off from 7 of these rooms and thus more than one-third of the cost saved.

should not cost more than $1.51 per pupil to heat these buildings, since one-half of the buildings were heated for less than that cost. Note that seven buildings in this group were heated for less than $1.22 per pupil. This might indicate that $1.20 to $1.25 per pupil is a fair cost for heating such buildings when the firing is properly managed. No school in this group has less than eight rooms. The Faxon and the Clay buildings are both new and built on the same plan.

Group II.—The second largest group of school buildings is heated by direct steam. There are 16 in this group. The lowest cost in this group is the Irving, $0.944 per pupil, and the highest cost is the Longfellow, $2.146 per pupil. The median cost is $1.331. However, it will be noted that 6 of this group are heated for less than $1.06. It would seem from the very nature of the case that direct steam heat should be cheaper than steam hot-blast. Hence it would seem that $1.05 to $1.10 per pupil is a fair cost for such heat.

SIXTEEN BUILDINGS HEATED BY DIRECT STEAM

Irving	$0.944	Yeager	$1.424
Jefferson	0.964	Phillips	1.636
Woodland	1.023	Karnes	1.712
Emerson	1.058	Garrison	2.084
Washington	1.058	Adams	2.086
Hamilton	1.101	Webster	2.110
Lincoln	1.203	*Longfellow	2.146
Martin	1.277	Median cost	1.331
Lowell	1.384		

* An incompetent janitor is named as the explanation of the high cost in the Longfellow.

Three other groups of elementary school buildings were studied in a similar manner.

Group VI. High Schools.—

Manual Training High	$1.905	Central High	4.079
Westport High	2.251	Northeast High	4.904
Lincoln High	2.694		

The cost here is necessarily greater than in the elementary schools, as more cubic feet of space per pupil must be heated. However, in some of these schools the cost seems excessive, especially in the Northeast High School, with a cost of $4.90 per pupil. The operation of the air-washer adds something to the cost of the heating in this building. The

fact that the building stands in the open and is fully exposed also adds to the cost. After a reasonable allowance is made for this additional cost, the still excessive cost would indicate one of two things: incorrect and wasteful methods of firing or improper fire grates or fire boxes causing excessive waste of fuel. A saving of $1,000 to $2,000 on the coal bill of this building would seem possible. It is impossible at this season of the year, August, to determine the real cause of this high cost. However, this may be worked out during the next school year.

GENERAL CONCLUSION

It seems evident that by proper attention on the part of the janitors to correct methods of firing and of economizing fuel an annual saving of from $5,000 to $10,000 could be made in the district.

The cost per 1,000 cubic feet to be heated may be fairer than the cost for each pupil, but the dimensions of the buildings were not available for this study.

Note 1.—Three kinds of fuel are used—oil, soft coal, and hard coal. Some allowance must be made for varying cost of the kinds of fuel.

Note 2.—In 1915–16, the Central High School will be opened. This building is very similar to the Northeast Building and will be heated by slack fed into the furnace by mechanical stokers. This will enable an accurate comparison of the cost of heating in the two buildings to be made. In the Northeast High School soft coal is used; oil is used in all the other high-school buildings.

Such studies as this show conclusively the need of standards for the cost of heating, lighting, water, supplies, janitor service, etc.

B. STUDY OF SCHOOL PROGRESS

The following study was made of the Kansas City, Missouri, ward-school graduates of June, 1915.

Just before the close of the school year the following "Individual School History" blank was sent to each member of the graduating class by the Bureau of Research and Efficiency:

INDIVIDUAL SCHOOL HISTORY

SEVENTH-GRADE PUPILS

1. Name.....Street Address.....
(Write surname first)
2. When were you born? Year....., Month....., Day.....
3. Where were you born?.....
4. What will be your age June 11, 1915? Years...., Months...., Days....
5. Did you attend kindergarten?..... When?..... Where?.....
How many months?.....
6. In what year and month did you first enter school (not kindergarten)?
Year....., Month.....
7. Where did you first enter school?.....In what grade?.....
8. How old were you when you first entered school (not kindergarten)?
Years....., Months.....
9. Have you attended school a part or all of each school year since you entered school?.....
10. How many school years or parts of school years have you attended school?
.....
11. Have you ever missed as much as five (or more) consecutive months of school? List below each such absence from school:

When (year)?	Number of months?	Why?	In what grade?
a.....	.....	.....	.....
b.....	.....	.....	.....
c.....	.....	.....	.....

12. When did you first enter school in Kansas City?.....
In what grade?.....
13. Have you at any time repeated a grade or a class? If so, what grades or classes?.....
.....
14. Have you at any time skipped a grade or class? If so, what grades or classes?.....
.....

Careful directions were sent as to the method that should be pursued and the care that should be exercised in answering the questions, in order that the answers might be as accurate as possible; though the children depended upon their own memory and that of their parents, it is felt that in most respects the answers are fairly accurate.

It will be noticed that many of the questions are so put that the answers serve as a check upon each other. The papers were carefully

examined before the study was made, the answers compared and checked, and corrections made wherever it was evident an error had been made.

In this study we had in view the following problems: (1) to determine the time required to finish in the seven-year system which is in force in the Kansas City schools (boys and girls were kept separate in the study); (2) since about one-half of this class had a year's work in the kindergarten before entering the grades, a secondary problem was to determine the length of time required to finish by kindergarten children and also by non-kindergarten children (those who had not had work in kindergarten) and to compare the progress of the two groups in the matter of time required to finish; (3) some secondary problems that are omitted here.

It is felt that the first problem is of special interest because Kansas City has only seven years in the elementary-school course.

All children who entered the Kansas City schools after 1910 were excluded from this study in order that all children included might be placed upon an equal footing in regard to the school system. In doing this it was assumed that the difference in the first two years' work would not be very great, whether in a seven-year or an eight-year system, and that a child having had two years' work outside of Kansas City would usually enter the third grade upon coming to Kansas City. When a pupil was absent more than one-half the year, that year was not counted as a school year for him. Of the 2,084 white graduates in 1915, 378 were excluded and 1,706 were used for this study.

TABLE I

NUMBER OF PUPILS STUDIED, INCLUDING KINDERGARTEN AND NON-KINDERGARTEN

	Boys	Girls	Total
Number of pupils studied.....	847	859	1,706
Number of kindergarten pupils.....	417	406	823
Number of non-kindergarten pupils...	430	453	883

Table II shows that this class was about equally divided between seven and eight years in time required to finish; that a small number, 96, required less than seven years, and 239 required more than eight

years. Five pupils finished in five years. Four of these were non-kindergarten pupils and were overage at entrance into school.

TABLE II

NUMBER FINISHING AND YEARS REQUIRED

	NUMBER OF YEARS TO FINISH								
	12	11	10	9	8	7	6	5	Total
Number of boys, non-kindergarten	0	5	12	73	192	133	12	3	430
Number of girls, non-kindergarten	1	0	14	50	206	159	22	1	453
Number of boys, with kindergarten	0	0	8	48	145	189	26	1	417
Number of girls, with kindergarten	0	0	5	23	142	205	31	0	406
Total	1	5	39	194	685	686	91	5	1,706
Percentage, total	0.05	0.29	2.28	11.37	40.21	40.15	5.33	0.29	100
Percentage, non-kindergarten boys and girls	0.12	0.57	2.95	13.93	45.07	33.07	3.85	0.45	100
Percentage, kindergarten boys and girls	0.00	0.00	1.58	8.63	34.87	47.87	6.92	0.12	100

Table III shows that the class as a whole required about seven and two-thirds years to finish the course, a saving of about 0.75 of a year over the eight-year system, since the average time required in most eight-grade systems is about 8.4 years. The time required for the girls is slightly less than that for the boys.

TABLE III

AVERAGE TIME REQUIRED	Years
Average time for all boys and girls	7.65
Average time for all boys	7.72
Average time for all girls	7.58

Table IV, which is a comparison of kindergarten and non-kindergarten children, shows that in the matter of time required to

TABLE IV

COMPARISON OF TIME REQUIRED BY KINDERGARTEN AND NON-KINDERGARTEN CHILDREN

	Non-Kindergarten	Kindergarten
Average time required, boys and girls	7.80	7.50
Average time required, boys	7.87	7.56
Average time required, girls	7.72	7.42

finish the kindergarten children have an advantage of about three-tenths of a year over the non-kindergarten children. The kindergarten girls also finish in less time than the kindergarten boys. An average of only 7.42 years was required by the kindergarten girls.

Table V is another comparison of the time required to finish. In making this study, the necessity for a system of cumulative records whereby the advancement of a child through the grades can be traced accurately became clearly evident.

TABLE V

TIME REQUIRED TO FINISH

	7 Years or Less	8 Years or More	Total
All, boys and girls	782	924	1,706
All, kindergarten boys and girls	452	371	823
All, non-kindergarten boys and girls	330	553	883
Kindergarten boys	216	201	417
Kindergarten girls	236	170	406
Non-kindergarten boys	148	282	430
Non-kindergarten girls	182	271	453

C. OPPORTUNITY OF INDIVIDUALS

The following summaries taken from the reports on double promotions, special promotions, and special demotions give an insight into the chance that the individual will have his special needs met and that he will be considered apart from the mass or group.

TABLE VI

DOUBLE PROMOTIONS DURING THE SECOND THIRTEEN WEEKS OF THE YEAR 1914–15

First grade	22	Fifth grade	9
Second grade	18	Sixth grade	6
Third grade	18	Seventh grade	1
Fourth grade	14	Total	88

Combining the 88, the 436, and the 420 cases of Tables VI, VII, VIII, we have only 944, or less than 3 per cent of the elementary-school enrolment, that received special promotions, demotions, or double promotions during one-third of last year. Are there not more pupils needing this special attention? From Table VII it is to be noted that it is two and one-half times easier to secure a special promotion in the same room than to a higher class in another room (315 were promoted within rooms, and only 121 to other rooms). It would appear that the barrier between rooms must be somewhat greater than between classes in the same room, though such a circumstance clearly ought not to operate to limit the child's opportunity.

TABLE VII

SPECIAL PROMOTIONS TO HIGHER CLASSES

	In Another Room	In Same Room
First grade	52	72
Second grade	21	57
Third grade	20	59
Fourth grade	6	42
Fifth grade	15	62
Sixth grade	7	19
Seventh grade	0	4
Total	121	315

TABLE VIII

SPECIAL DEMOTIONS TO LOWER CLASSES

	In Another Room	In Same Room
First grade	60	70
Second grade	28	29
Third grade	38	34
Fourth grade	10	24
Fifth grade	22	32
Sixth grade	17	34
Seventh grade	11	11
Total	186	234

While these summaries indicate that nearly all the pupils of the schools are moved forward in mass, it is very probable that the oppor-

tunity for individual adjustment is somewhat greater than is here indicated, for two reasons: First, the form of report used was new and in several cases it was evident that errors had been made, and the reports were returned for correction. However, in other cases the reports may not have been understood and errors may have been made. Secondly, the most probable form of error would be a failure to report special promotions and demotions by oversight or because of failure to keep a record of all such cases.

While the majority of pupils are average pupils and should move in mass, there is a considerable number of especially slow pupils and also of especially bright pupils that should not be sacrificed to mass movement.

It is very comforting to note that the figures given above show 16 more special promotions than special demotions. This means that the bright children are being given a chance. The bright children need special opportunities for advancement as well as the slow children.

The problem of meeting the needs of the individual pupil in city-school systems is still an unsolved one. It baffles both teachers and school administrators. One forward step has been made in that the problem has been recognized. For years teachers and school superintendents refused to admit the existence of such a problem. Some progress is being made in the solution of the problem through supervised study hours, special-help periods, more individual instruction, and less mass teaching.

D. EFFICIENCY OF SCHOOL WORK

In measuring the efficiency of teaching, the median results for the entire city were computed. These results were furnished to each principal and thus it was possible for a principal to compare each room in his building with the city medians and determine where added emphasis was needed or where improved methods were needed. In handwriting a test was made and the following directions were given the pupils in October:

PUBLIC SCHOOLS, KANSAS CITY, MISSOURI

PUPIL'S DIRECTION

Write as well as you can at your usual speed the following stanza. Write the stanza again and again until I say "Stop." At the command, stop at

once, even if in the middle of a letter. Use a line of paper for each line of stanza. Use no punctuation marks.

Speak the truth
In the end it shall appear
Truth is best in age and youth

The teachers and principals were directed to have each pupil read this stanza twice before beginning to write, to have the pupils write exactly two minutes, and to have no writing on the papers except the stanza—no name, no grade, no school, and no number. The samples in each building were collected by rooms and grades, and each bundle was properly labeled. These samples were then given key-numbers, and put up in bundles of 150 to 200 papers each, and assigned to about one hundred teachers who were especially good in handwriting, who volunteered to score the papers by the Thorndike scale. When these papers were returned and the scoring studied, it was found that the standards of the scorers, even when the scale was used, were so different that the comparisons of rooms or buildings would be worthless. Then it was determined to take a group of normal-training-school students and train them to use the Thorndike scale. Twenty of these students were chosen. The material used was that devised by Dr. E. L. Thorndike and described in the *Teachers College Record* for November, 1914. The standard specimens were graded independently by the normal students on eight different days. After each grading a conference was held and specimens that were not accurately graded were studied more closely. Freeman's suggestions on grading handwriting were also read by the students. Although no effort was made to follow the Freeman plan, yet it perhaps had some influence in their grading. The standard specimens were cut apart, their numbers concealed, and then the specimens graded. Also at these daily conferences twenty samples of the students' writing were numbered serially and were graded by each of these normal students, and the twenty students then compared their results on each of these specimens. In this way, in about two weeks they became so skilful that they varied only 3 to 5 per cent on a group of twenty papers. This body of twenty students then for a small stipend graded 57,863 writing samples. The ranges and medians for the city are given in Tables IX–XI.

Mr. Freeman's standards (Table XII) are for an eight-grade system. For the Kansas City schools with a seven-grade system the standards

TABLE IX

RANGES IN CLASS MEDIANS IN QUALITY-HANDWRITING

Grade	October	May	M-O	H
VII	8.1–11.5	8.4–14.0	8.5–14.0	8.8–13.8
VI	7.9–11.2	8.2–11.9	8.2–14.1	8.5–13.2
V	7.5–10.3	7.5–11.0	7.1–11.6	8.3–12.0
IV	7.5– 9.7	7.1–10.9	7.1–10.1	6.3–12.2
III	6.8– 9.6	6.8– 9.9	7.0–10.0	6.8–11.1
II	.....	5.9– 9.0	.....	6.2–10.1
I	.....	.....	.....	5.5– 9.3

October = October papers.
May = May papers.
M-O = May papers of the same pupils that were in these grades in October.
H = Special papers collected by the writing supervisor.

TABLE X

RANGES IN CLASS MEDIANS IN SPEED-HANDWRITING

Grade	October	May	M-O
VII	17.5–119.0	50.5–118.0	50.5–118.0
VI	34.0– 93.0	35.5–111.0	35.5–105.5
V	21.5–107.0	49.5–100.5	50.5– 99.0
IV	11.5– 83.0	39.0– 91.5	44.5– 81.0
III	14.5– 63.5	29.5– 69.0	30.5– 83.0
II	.....	15.5– 78.0	.....

TABLE XI

CLASS MEDIANS IN HANDWRITING

GRADE	QUALITY				SPEED		
	October	M-O	Gain	H	October	M-O	Gain
VII	9.5	10.6	1.1	11.4	72	77	5
VI	9.1	9.9	0.8	11.0	65	76	11
V	8.7	9.4	0.7	10.5	60	69	9
IV	8.2	8.8	0.6	9.3	49	64	15
III	8.0	8.2	0.2	8.4	35	53	18
II	.....	.....	.....	7.6	.....	.....	.....
I	.....	.....	.....	7.2	.....	.....	.....

of Table XIII are proposed. It is to be noted that the quality suggested for the seventh grade is only 12. These standards are for the quality of work at the end of the year. A pupil who on completing the sixth grade writes quality 11.5 on the Thorndike scale at the rate of 80 letters per minute has reached the sixth-grade standard in writing.

TABLE XII

FREEMAN'S PROPOSED STANDARD FOR QUALITY AND SPEED IN HANDWRITING
(The quality is converted into units of the Thorndike scale instead of the Ayres units)

	School Grade						
	II	III	IV	V	VI	VII	VIII
Quality.....	8.0	8.4	9.1	10.0	10.7	11.6	12.7
Speed.....	36	48	56	65	72	80	90

TABLE XIII

PROPOSED STANDARDS FOR KANSAS CITY SCHOOLS—SPEED AND QUALITY

	School Grade					
	II	III	IV	V	VI	VII
Quality.....	7.5	8.5	9.5	10.5	11.5	12.0
Speed.....	36	48	60	70	80	90

That these standards are easily attainable is indicated by the fact that in May the six rooms doing the best work in each of the various grades of the city averaged 0.6 of a Thorndike point above the standard in quality proposed, and also averaged 21 letters per minute above the standard in speed. Even in October, the six rooms doing the best work averaged only 0.5 of a Thorndike point below the proposed quality, and the average speed in October of these rooms was 10 letters per minute above the standard. It is not expected that every pupil in a room will reach the standard set, but the majority should reach the standard, and the higher the quality of teaching, the fewer will be the exceptions. The standard quality and speed should be maintained in all written work.

Good teaching and good grading keep pupils of like ability together. When a pupil reaches the standard in writing for his grade, he may give

his attention to other studies. The presence in a room of a few especially good writers is no guaranty of good teaching. They are usually natural exceptions. In some cases, indeed, they are actually the products of poor teaching—the kind of teaching that takes care of the promising pupils to the neglect of the remainder.

In October, 1,743 of the writing papers were worth 12 or more; this was about 11 per cent of the whole number of papers graded. At the same time 2,076 pupils wrote more than 90 letters per minute. It is a waste of time to require pupils who can write quality 12 at the rate of 90 letters per minute to continue practice in writing. The sixty hours of school time usually devoted to writing each year should be devoted to other work by pupils who have reached the standard. All attempts to train beyond a reasonable standard result in much waste of time and energy. Of the special papers prepared for Mr. Holt in May, 3,650, or about 18 per cent, were graded 12 or above. These people are doing satisfactory writing, and 2,400 of these pupils are below the seventh grade. It is possible that the high quality of these papers was obtained at the sacrifice of speed.

These facts show conclusively that there are large numbers of the elementary-school pupils who write well and rapidly. A school system should be judged, not by its best nor by its poorest product, but by its average product. The average writing product in the Kansas City schools, while comparing very favorably with the average product in other systems, is not quite so good in quality or in speed as it should be. With definite standards to be reached and close supervision by the writing supervisor, in a year or two at most the standards proposed should be reached by practically all rooms. In fact, a few entire school buildings have now reached the standard. Some buildings last year gained nearly 2 Thorndike points between October and May. However, the standard calls for only 1 point advance each year. Hence, schools below standard should be able, by extra effort, to advance to standard.

Mr. Freeman, in discussing his proposed standards in handwriting, says:

> The data which have been presented indicate that this standard can be attained with an expenditure of time of not over 75 minutes a week. The writer is convinced on the basis also of some of the data that it could be attained generally, as it is in some cases, by the expenditure of a much shorter amount of time. When the most efficient methods are employed, it will

probably be found that the expenditure of from ten to fifteen minutes in the intermediate grades suffices to fix the handwriting habit in its main outline, and that the expenditure of a small amount of time in the upper grades will maintain the efficiency of the habit and increase it by the amount of progress which is represented in the standard.

From the investigations made thus far I am of the opinion that generally, not only in Kansas City, but in other cities, too much emphasis is placed on writing in the lower grades. With well-directed work in Grades III, IV, V, writing can be fairly well mastered. Increased speed and improved quality in the sixth and seventh grades will come with very little practice—one or two ten-minute periods per week—if right habits have been established in the intermediate grades.

Rooms below standard are advised to make an "extra effort" on penmanship. This does not mean additional time, but better methods of teaching, more specific and purposeful drills, a closer study of the needs of the class, the elimination of waste, and more corrective individual work. Without doubt ample time is spent in the teaching of penmanship in all the grades and too much time in some grades.

CHAPTER XII

THE EFFECTS OF EFFICIENCY TESTS IN READING ON A CITY SCHOOL SYSTEM

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At the request of the committee the following brief statement is made of the effects of a series of tests in reading on the teachers and administrators of a school system. It is not the purpose of this paper to repeat the tables showing the numerical results of these tests, but rather to comment briefly on the significance of the tests for the system of schools.

In the beginning the teachers were somewhat skeptical as to the purpose of the tests. Some thought that it was an attempt to check up the work of the individual teacher as a basis for determining his or her efficiency. There was no large amount of experience in the system itself in the giving of tests or in the evaluating of results. The selection of the subject to be investigated was determined in part by the interests of the supervisors and in part by the suggestions derived from earlier scientific studies on reading.

After a number of conferences between the superintendent and the supervisors of the system, the following program was adopted as a suitable one for a series of tests: (1) to ascertain the rate of reading, both oral and silent, as it is now taught in this system of schools; (2) to ascertain the relation that the rate of reading of one grade bears to its next higher grade as a standard of advancement; (3) to ascertain what factors are of greatest influence in affecting the rate of reading; (4) to ascertain the relation that the rate of reading bears to the result achieved in the process of reading considered as a thought-getting process.

The immediate result of the tests was to call the attention of the teachers to many problems of method which had heretofore entirely escaped their attention. Their original notion was that the way to teach reading is to read, read, read. The moment they began to perform these tests, it became evident to them that the child, in learning to

read, is facing a multitude of difficulties without being guided by any definite notion of how to proceed. In fact, they learned that it is important for the teachers, as well as for the students, to make distinctions that heretofore had escaped their attention. This is well brought out in the following quotations from individual grade teachers:

1. "We do not know how to teach silent reading."
2. "We had not realized the importance of efficiency in silent reading as related to the rest of the subjects."
3. "We are going to emphasize silent reading and the grasp of content."
4. "We will not teach oral reading less, but silent reading more."
5. "The problem is ours. We will assist in its solution."
6. "We have a new interest in teaching reading."

A brief summary may be given of the general and specific results which came from the series of tests.

GENERAL

1. The attitude of pupil and teacher toward the subject changed.
2. The utility of silent reading stressed.
3. Greater emphasis placed on the proper method of presenting and conducting reading-lessons, especially so far as the rate of reading and the grasp of content are concerned.
4. Closer correlation of reading with the other subjects.

SPECIFIC

1. A more definite standard for judging the efficiency of reading.
2. A more elastic system of promotion by subjects.
3. Closer attention to the individual differences of pupils in reading ability, thus adapting more closely the type of training to the individual pupil.
4. A greater economy of time effected in teaching the subject.
5. Greater intelligence and interest in the use of standards and tests in judging results of teaching.

Perhaps many of these results may seem to the reader overstated. However, great care has been taken in the formation of these judgments to ascertain and formulate premises based upon the direct experience of teachers who are daily presenting the work in the classroom. The results seem to indicate that the study has been very beneficial in

achieving higher quality of teaching, not only in reading but in other subjects as well.

At the time of writing this article teachers of the English department in the high school (unsolicited) brought the report that pupils in the language department showed much greater preparation than in former years. This improvement in language is believed to be in part due to the emphasis on the reading work of the elementary schools.

This, with other evidences, seems to justify the belief that the school system itself has been greatly improved through the interest aroused in this study. Let me mention especially four ways in which the entire system is affected:

1. A more scientific attitude and method in the subject is established.
2. A closer checking-up of results is obtained.
3. More definite teaching is practiced.
4. More efficient learning results.

CHAPTER XIII

INVESTIGATION OF SPELLING IN THE SCHOOLS OF OAKLAND, CALIFORNIA

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An extensive investigation of the subject of spelling was made in the Oakland schools during the past year, covering Grades II–VIII inclusive, in forty of the forty-one schools of the city. In addition to an examination of the general administrative policy affecting spelling, the schedules of time-allotment, the content of the course, lesson-assignments, and methods and devices in use in the classrooms, a test of the efficiency of spelling was made by the use of the Ayres Springfield lists.[1] The tests were applied to 12,985 children.[2]

The tests were all given on the same day, to the younger children in the forenoon, and to the older children in the afternoon. The words were pronounced in the usual way by the classroom teacher, in the presence of a member of the investigating staff (some fifty advanced students of education had been carefully instructed for this purpose). The words were marked, partly by students, and partly by principals and teachers. No principal or teacher marked papers from his or her own school.

The purpose of the study was to get together the facts necessary as a basis for a scientific handling of this branch of the curriculum, to interpret these facts in the light of sound principles of administration, supervision, and teaching, and to make the results available for study by those engaged in supervising or teaching the subject.

The results of the tests were expressed in terms: first, of group averages; secondly, of the distribution of individual scores within these groups; thirdly, of individual differences due to (*a*) age, (*b*) sex, and (*c*) general ability (teacher's estimate); fourthly, of social differences

[1] These lists have since been embodied in a complete spelling scale. See Leonard P. Ayres, *Measurement of Ability in Spelling*. New York: Russell Sage Foundation, 1915.

[2] The full report is published by the Oakland School Department as *Publication No. 1* of the Bureau of Information, Statistics, and Educational Research, June, 1915.

due to (*a*) father's occupation, (*b*) father's nationality, (*c*) the child's occupational ambition, and (*d*) the child's home language; fifthly, of the relation between time-allotment and spelling ability.

In terms of the standard (70 per cent) the averages for the city as a whole, for all but three of the separate schools, for all grades but second and third, rank high. The average score for the city is 76.5 per cent. The difference between averages attained by different schools is wide; the higher scores are attained by the larger schools. In some schools grade averages vary but slightly, while in other schools such variation is extremely wide. Also, when the scores of all the children in the city are averaged by grades, these averages vary as much as 24 per cent, and the variation of class averages within a given grade is even wider still, while the distribution of individual scores within a class, a grade, or a school, ranges from zero to perfect. And since 21 per cent of all the children in the city made perfect scores, it is evident that the test was inadequate.

The overlapping between grades and the wide difference between scores attained by different schools and by different grades show that there is no common standard for promotion in this subject.

Incident to the study of scores in the light of individual differences the schools were found to be over 60 per cent retarded. Every grade contained children at least eight years apart in ages, and a careful study showed that the accelerates invariably scored higher than their grade averages, while retardates regularly fell below, and the more retarded the lower their scores.

The influence of sex, while not pronounced, is fairly constant, with a tendency to increase with age. And the correlation between general ability (teacher's estimate) and ability to spell is constant and marked.

Differences between the scores of different social groups, as indicated above, appear, but they are not pronounced, and the effect of the home language, either as to extent or type of errors, is practically negligible.

There is no evidence in the results of the tests, nor in other information gathered, to show that spelling is standardized in respect to content, method, length of lesson-assignment, time-allotment, or amount to be learned. From the standpoint of group averages the schools stand high, but from the distribution of individual scores it is evident that important individual and social differences do not enter as determining factors in the organization and teaching of the subject.

CHAPTER XIV

STANDARD TESTS AS AIDS IN THE CLASSIFICATION AND PROMOTION OF PUPILS

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The two chief sources of waste in education are (1) teaching things that the bright pupils already know and (2) teaching things that none of the pupils need to know. Economy in the latter will be achieved by ascertaining what the really essential and important things in each subject are. Economy in the former will be achieved by classifying and promoting pupils, not according to time, but according to ability.

One third of the pupils waste time by being in classes in which they know practically all the material that is being covered in the recitation period and are able to perform all the tasks expected of them. Another third of the pupils waste time by being in classes in which they can grasp very little of the material and are able to perform very poorly, or not at all, the tasks expected of them.

One pupil out of every three is promoted too slowly and one pupil out of every three is promoted too rapidly. One pupil in every three could finish the eight grades in seven years or less, and one pupil in every ten could finish the eight grades in six years or less. The reason for this situation is that the schools do not know in any accurate way the actual abilities of their pupils and are unable to compare in any precise manner the abilities of the pupils with one another. The result is that there are no definite, tangible standards with which the pupil of any given grade can be compared so as to ascertain whether he is up to the standard or not.

I shall now attempt to show by concrete examples the basis of these assertions and the means by which a more accurate classification of the pupils may be brought about.

Standard tests in reading, writing, spelling, and arithmetic were carried out in an elementary school in Madison composed of approximately 350 pupils. The results of these tests are shown for each subject and for each grade by the distribution-curves in the following figures.

Let us examine first the performance of the pupils in writing. The tests were designed to measure speed and quality of writing and were performed according to the specifications published by the writer in the *Journal of Educational Psychology*, February, 1915. The speed of writing was expressed in terms of the number of letters written per

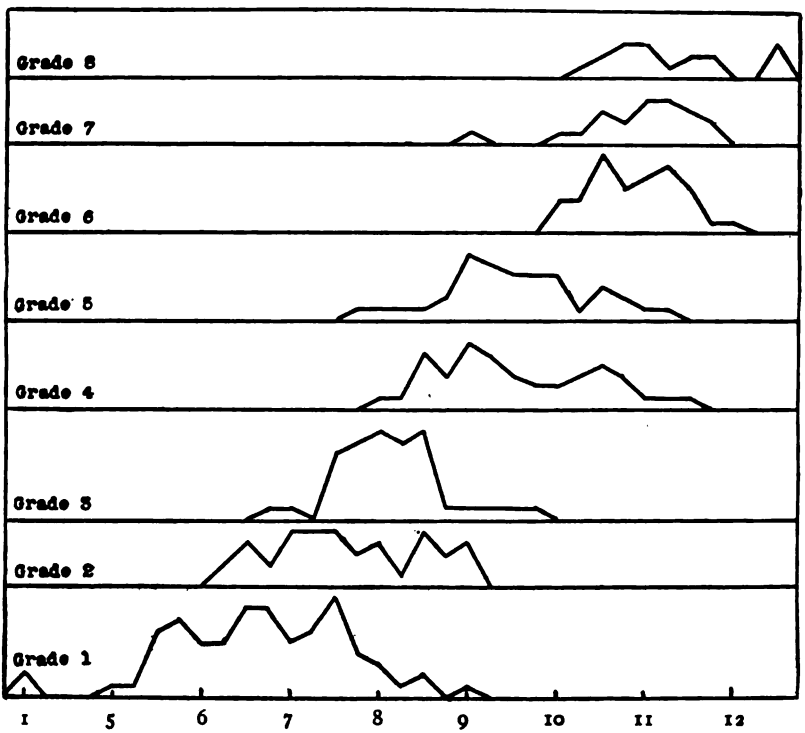

CHART I.—Distribution of pupils in writing in Grades I-VIII. The numbers along the base-line are the scores expressed in terms of the Thorndike scale.

minute, and the quality was measured by the Thorndike scale. By a process of equating speed and quality so as to express a pupil's writing ability in a single score, all the results were evaluated and represented in the curves of Chart I. The numbers along the base-line from left to right are qualities on the Thorndike scale. The distances vertically above each base-line represent the number of pupils. Thus it will be seen that the pupils in the first grade range all the way from quality 4 to

quality 9, and the pupils in the second grade range all the way from quality 6.25 to quality 9. The striking fact is the enormously wide range of abilities in each grade and the resulting overlapping of the abilities of one grade over those of the other grades. By actual computation, 32 per cent of the pupils in any given grade equal or exceed the median of the next grade above it. A corresponding percentage of pupils equals or falls below the median of the next grade below.

The tests in reading were designed to measure speed and comprehension and were made according to the specifications published by the writer in the *Journal of Educational Psychology*, January, 1915. The reading ability of each pupil is represented by a single score in which his performances in speed and in comprehension are combined. The results are shown in Chart II in a manner similar to that met in Chart I. The facts for reading are similar to those for writing. The range of ability in each grade is enormously wide, and the overlapping is likewise extensive. In the case of reading, 31 per cent of the pupils in any given grade reach or exceed the median of the next grade above.

The tests in spelling were made with the lists published in the *Journal of Educational Psychology*, March, 1915. The distributions and overlappings, as shown in Chart III, are in all essential respects identical with the two preceding tests. Twenty-three per cent of the pupils of any given grade reach or exceed the median of the next grade above.

Ability in arithmetic was measured by means of the Courtis tests, Series A. It was found that 32.5 per cent of the pupils in any given grade reach or exceed the median of the next grade above.

The question which now arises is this: Would not the range of ability and the overlapping be very much less if each pupil's performance in all studies were combined? Thus, a fourth-grade pupil might write as well as the average seventh-grade pupil and read as well as the average fifth-grade pupil, but spell no better than the average first-grade pupil. His average performance in all studies combined might be approximately what it should be for the fourth grade.

What are the actual facts? A combined score for all studies was computed for each pupil, so that the various subjects were balanced against each other. It was found that even then the overlapping was practically as large. Thirty-two and two-tenths per cent of the pupils in any given grade reach or exceed the standard of the next grade above

it; thirty-five and two-tenths per cent fall to or below the standard of the next grade below. The schools have not been able to measure in any accurate manner the actual abilities of the pupils, nor to compare them with any objective standards.

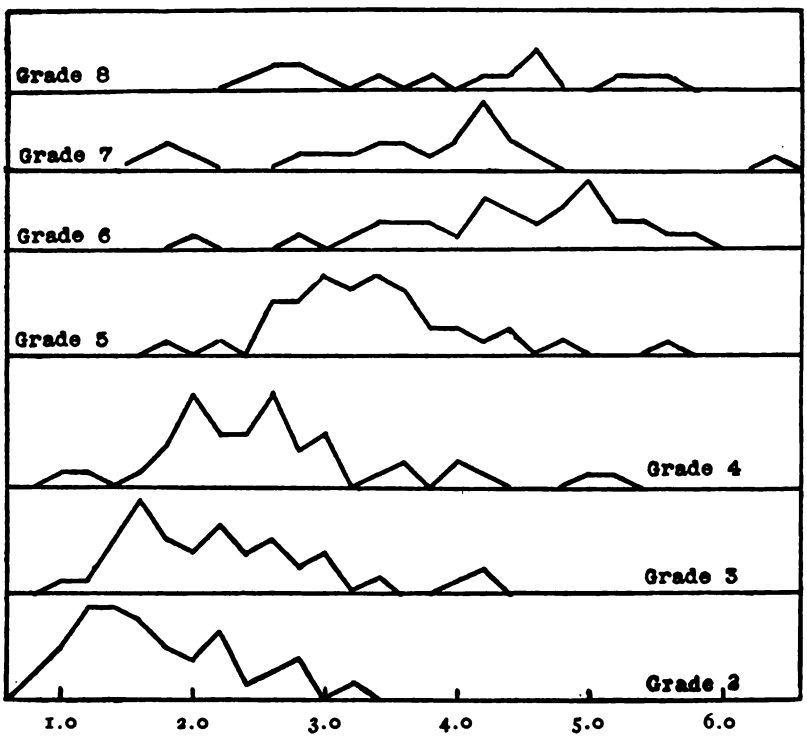

CHART II.—Distribution of pupils in reading in Grades II–VIII. (The numbers along the base-line are the scores in which speed and comprehension are combined, but expressed in terms of words read per second.)

It is obvious that a considerable economy in time could be effected by classifying and promoting pupils according to their actual abilities or performances in the various studies. One-third of the pupils are one or more years ahead of the grade in which they are placed and could, therefore, complete the elementary school one year earlier and be fully up to the standard of the average eighth-grade pupil.

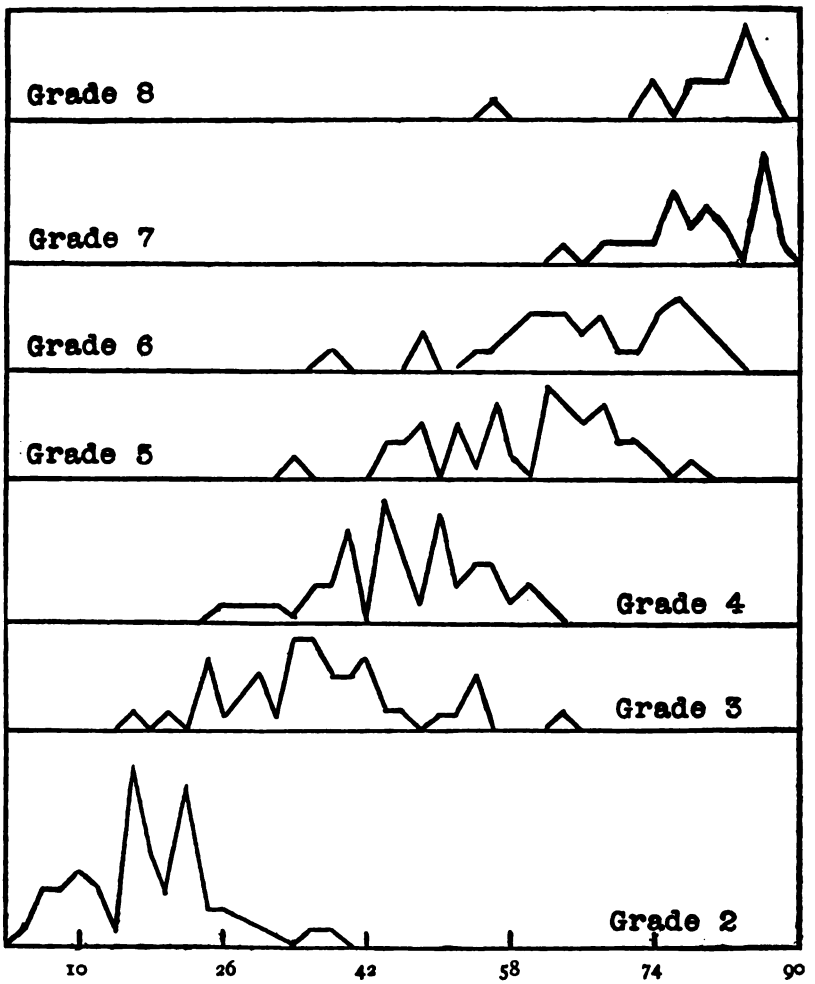

CHART III.—Distribution of pupils in spelling in Grades II–VIII. (The numbers along the base-line represent the percentage of words spelled correctly in the specified lists.)

Every school system ought to have a department of testing by means of standard scales and tests, so that the actual abilities and achievements of pupils could be rated accurately and made use of in classification and promotion. The principle of promotion according to ability rather than according to time would also have the advantage of acting as an incentive to the pupils to do their best.

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CHAPTER XV

THE USE OF MENTAL TESTS IN THE SCHOOL

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The object of mental tests, practically considered, is to secure by a relatively refined and precise method a more accurate determination of the mental traits or the general mental status of a pupil than can be secured by other methods, as by inspection of his marks or his school progress or by the teacher's personal estimate. Roughly speaking, the mental tests now available for use with school children are of two sorts: first, those which aim to determine with some precision the presence or the absence or the amount of some specific mental characteristic, e.g., tests of memory-span, of quickness of learning, of pitch discrimination, of color-blindness, etc.; secondly, those which aim to determine with perhaps somewhat less precision the general status of the child's intelligence, his mental level or general all-round ability as related to that of other children of the same nationality, sex, age, and social status. In this second field the Binet-Simon tests have received such preponderant emphasis and attention as to constitute at present almost the only system of tests of general intelligence with which the educational public is acquainted.

In principle, the first sort of tests—those which bring to light specific mental abilities—are of most decided interest and importance for the work of the schools. In practice, they have received almost no attention from school men, and it is impossible because of that, and more especially because they necessitate the participation of an investigator who possesses special training in general, experimental, and applied psychology and a good acquaintance with schoolroom problems, to urge at this time any wholesale adoption of them in public-school systems. What we should urge is that, in those school systems in which the conditions are favorable for the development of educational research, there should be created the office of *consulting psychologist* and that this official should be commissioned to make intensive studies of all sorts of special

cases in which the analysis of mental abilities and disabilities would throw light upon the means of instruction that would accomplish maximal results for school progress. There is no school system of any size that does not contain dozens and scores of pupils who present special psychological problems. Examples are: pupils that cannot learn to spell, pupils that have special difficulty in committing to memory, pupils that are slow in acquiring the technique of reading, pupils that display exceptional gifts in special lines of work, pupils that seem to be tone-deaf, pupils that present peculiar and seemingly inexplicable resistance to disciplinary control, pupils that exhibit speech disorders developed from compulsory right-handedness. In fine, the painstaking scrutiny and intensive study of all individuals that exhibit striking peculiarities in their mental equipment is a form of educational research that is greatly to be desired, that some of our best-equipped school systems could readily afford, and that demands for its prosecution the application by an expert of numerous special forms of mental tests.

Tests of the second sort—test-systems designed to measure general intellectual status—have come into considerable prominence in the past decade through the interest developed by the Binet-Simon tests. These tests were first proposed in 1905 by the eminent French psychologist, Alfred Binet, and his collaborator, the physician, Dr. Simon, in response to an inquiry as to what devices might be used to segregate, for placing in special classes, pupils too defective mentally to profit by instruction in regular classes. This preliminary statement was replaced in 1908 by a more systematic formulation and this 1908 series was again replaced three years later by what is known as the 1911 revision. The extraordinary cleverness with which they were devised, the novelty of the principles they embodied, and their surprisingly satisfactory outcome from the schoolman's point of view, all conspired to focus upon these tests the active attention of psychologists and educators in all civilized countries. The extent of this activity may be gauged by the number of titles, 254, in the Binet-Simon bibliography published by Kohs in 1914. One consequence of this activity has been a flood of criticism, both constructive and destructive, which renders anything like an authoritative standardization of every detail of procedure in the application of these tests quite out of the question at the present time. Fortunately, however, from the immediately practical point of view, it is unnecessary to go into these technical details of criticism.

This report, then, will be limited to demonstrating by reference to several typical studies in American cities that the Binet-Simon tests are valuable devices for the administration and organization of school systems, to pointing out certain limitations in the tests, and to suggesting certain precautions that should be observed in their use.

As typical studies of the usefulness of the tests in this country we shall cite those by Goddard[1] (1911), Dougherty (1913), Adler (1914), Brigham (1914), and Hicks (1915).

Goddard reports upon the testing of all the pupils (2,000) of the public schools of Vineland, New Jersey, wherein it was found that 78 per cent of the pupils were "normal," in the sense of being either "at age," one year "advanced," or one year "retarded" when their mental is compared with their chronological age. Pupils testing two or three years behind their age, 15 per cent of the school population of the first six grades, are regarded as "merely backward," and as needing to be placed in special classes in order to profit adequately by instruction. Pupils testing four or more years behind their age (3 per cent of these were found) are ranked as feeble-minded. Particular attention is called to the equally serious misfits on the other side of the curve of distribution, i.e., to those gifted children who are not placed in the school grade which their mental attainments indicate. "Nothing could be clearer," says Goddard, "than the way in which these figures [referring to one of his tables] demonstrate what we all know from experience must be true, that is, that we drag the dull child up, trying to keep him up to his grade and hold the bright child back to keep him to the same grade, thus doing gross injustice to both." The following excerpts from his results are sufficiently typical to show what amount of disparity exists between the actual grading of children and the grading indicated by the Binet tests.

	Number	Percentage
In grades above what Binet scale would warrant.....	121	9.4
In grades corresponding to what Binet scale would warrant..	558	43.2
In grades below what Binet scale would warrant.....	558	43.2

The question at once arises: How far should the school be expected to show conformity to the Binet results in its grading? To this we may return later. Suffice to say that after all allowance is made, there

[1] Consult the references at the end of this chapter for sources.

remain many cases in which pupils are wrongly placed, and that the Binet scale offers one method of bringing the discrepancies to light.

In 1913 Miss Dougherty reported upon the results of Binet tests applied to 483 pupils of the public schools of Kansas City, Kansas, whose ages ranged from six to seventeen years and whose school grades ranged from the first to the eighth. While expressing the hope that the scale may be improved in certain details, this investigator quotes as directly applicable to her own results the following statement of Goddard (in the report above cited):

> It is almost beyond the bounds of possibility that we should get such figures as are shown in this table [a general distribution of results] unless the figures upon which it is based are amazingly accurate, and if they are accurate it gives us a wonderfully valuable method of measuring our efficiency and our accuracy in the grading of children, and points out the possibility of great improvement along this line—much to the advantage of the children and the comfort of the teacher.

Miss Martha Adler, assistant principal of Public School 77, New York City, reported in 1914 the results of two experiments upon the classification of pupils on the basis of Binet testing. In her first experiment 80 first-grade boys were tested in the middle of the year and the 35 who stood highest were placed together as the advanced section, while the remainder formed the regular section. Both sections were then carried forward as fast as their abilities would permit. The result was distinctly better progress for *both* sections than under ordinary methods of sectioning, that is, on other bases than mental ability. Her second experiment dealt with 89 fourth-grade boys; the general plan was similar and the results were similarly striking. Miss Adler is convinced that the Binet tests are worth while, not only for the pupils, but likewise for teachers and supervisors. Her experiments are of interest because they demonstrate the utility of mental tests for the classification of "normal" pupils into sections *within* the regular classes. On the need of such classification she says:

> Although a large majority of pupils enter school at six, a difference in their mentalities is manifest almost at the outset, and after a few weeks two or three groups are formed to provide for the different grades of intelligence. In other words, there are three classes in one class. Allowing for the most efficient instruction, and for a skilful use of that educational time-killer "busy work," we are nevertheless forced to admit that there is an incredible amount of time

wasted, and almost superhuman energy expended in attempting really to supervise two groups while teaching a third. In the higher grades the grouping is usually done sparingly, because of the sheer impossibility of covering the mass of subject-matter laid down in any way except by class instruction. Subject-matter increases in importance as the child advances—in fact, we are too much bound by a curriculum, and classifications, gradations, and groupings are made with reference to it, rather than with reference to the pupils. What we need is something which will increase the importance of the child's individuality.

In the same year, 1914, C. C. Brigham published results secured by applying the Goddard 1911 revision of the Binet-Simon scale to 309 pupils in the first six grades of the Princeton Model School. Brigham concludes that the scale not only graded accurately "in the long run" pupils of from seven to eleven years of age (there were too few cases at six years to generalize from), but was also "an adequate measure of individual differences at any of these ages." "This conclusion," he adds, "may be qualified by defining 'accurately measured' as a correct measure 96 per cent of the time, but there is strong probability that this measure approached complete accuracy."

During the past year, 1915, Vinnie C. Hicks, consulting psychologist of the Oakland, California, schools, has reported tests of all the children in a kindergarten of that city to discover whether the results showed a good correlation with the actual school progress of the children. Her final conclusion is that "the Binet tests given to entrants to the first grade would not result in any unjust labeling of them as mental defectives." On the contrary, "the most evident fault of the tests, if used as prognosticative of school progress, is over-optimism." Again she says: "The chief value of giving the tests would be in having them productive of proper distribution of entrants according to ability, into regular classes, classes for the slow but intelligent, special classes for the subnormal, expulsion [from the classes of the regular school system] for the feeble-minded."

The foregoing citations from five studies in American public-school systems represent, it will be understood, only a fraction of the available material.[1] They are adduced here as being enough to demonstrate that

[1] From Wallin, (*Mental Health of the School Child*, chap. xviii) it appears that the Binet tests are in use in at least the following American cities: Albany, Allentown, Altoona, Auburn, Aurora, Baltimore, Birmingham, Bloomfield, N.J., Buffalo, Cambridge, Camden, Chester, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Denver,

the Binet-Simon tests can be used to distinct advantage in the classification and grading of school children from the very first day of their work in the schools. It goes without saying that the use of the tests in this manner presupposes the actual organization within the school system of sections or groups of pupils classified in accordance with the tests. This is not the place to discuss the details of such organization, save to point out that every bit of the evidence indorses a plan of organization which embodies more than two such sections of groups within each of the usual school grades. Eventually, we shall undoubtedly seek to develop in all school systems at least four groups: the gifted group, the regular group, the slow group, and the group of moderately defective mentality. A fifth group—the mental defectives whose insufficiency is marked—will be relegated to special custodial institutions. This plan of organization will be recognized as essentially the one widely and favorably known as the Sickinger, or Mannheim, system, now in operation in Germany.

Stress has been laid in the preceding paragraphs upon the adequacy of the Binet-Simon tests in the differentiation of "normal" children into groups of approximately similar mental abilities. If the tests are adequate for this differentiation, it follows, *a fortiori*, that they are unquestionably adequate for the detection and segregation of the distinctly mentally defective group, including both the more serious cases that need institutional treatment and the less serious cases that need instruction in special classes in the public-school system. On this account no specific citations will be made here to the very extensive literature upon the use of the tests for organizing special classes for mental defectives, though this is the field in which the tests have been most often used and for which they were originally designed.

It remains, now, to consider certain limitations of the Binet tests and to note certain precautions that should be observed in their use.

Elizabeth, Englewood, Everett, Wash., Goldsboro, N.C., Grand Rapids, Hackensack, Harrisburg, Hibbing, Minn., Hoquiam, Wash., Houston, Jersey City, Lakewood, Ohio, Little Rock, Long Branch, Los Angeles, Louisville, Malden, Mason City, Iowa, Minneapolis, Montclair, Mount Vernon, Morristown, Muskegon, Mich., Newark, New Britain, New Brunswick, New Haven, New Orleans, North Bergen, N.Y., Newton, Oakland, Cal., Passaic, Perth Amboy, Philadelphia, Pittsburgh, Plainfield, Princeton, Raleigh, Reading, Richmond, Rochester, N.Y., Saginaw, St. Louis, Schenectady, Somerville, Mass., Somerville, N.J., Spokane, Springfield, Mass., Toledo, Trenton, Washington, West Hoboken.

Every expert who has dealt with the tests has found points to be criticized in them. No one claims that they are ideal or even as perfect as might be from a practical standpoint. Nearly everyone agrees that the tests of the lower school ages—up to the eighth year—are too easy, and that those of the higher ages—especially above the eighth year—are somewhat too difficult. The composition of the several tests has been criticized freely: some of them are felt to depend too much on school training; some of them are quite certainly wrongly placed (even in Binet's 1911 revision); others are condemned on the ground that they offer a one-to-one chance of success by mere guessing; still others are admittedly difficult to score. Similarly, the composition of the series for the several years is open to discussion; need is felt for an extension of the series above twelve years, and possibly for the insertion of finer gradations in the lower years; the interpretation of the data, particularly when certain tests are missed in the earlier years and others passed in the later years, offers much chance for debate. These and other criticisms can be offered against the Binet scale. Nevertheless, they are sufficiently met for our present purposes by the one outstanding fact that the tests, even with these imperfections, *do* work. School men need not cast aside an educational device just because it is open to improvement.

More important, in our opinion, than these details of improving the technique of the scale is the possible misinterpretation of what the tests really do for us. It should be understood, for example, that they do not pretend to afford a precise and comprehensive view of the mental aptitudes of the pupil. They tell us merely that, taken as a whole, a given pupil can do approximately those things that most children of a certain age can do. But in another way, two pupils might both test eight years mentally and yet be very different from one another; an imbecile who tests eight years and who is actually twelve years old has quite a different mind after all from the normal eight-year-old child.

Again, it is important not to forget that even if the tests should measure native ability ideally, still we should not expect a complete correspondence between the test results and school progress, for the fairly obvious reason that school progress depends on other factors than native ability. Industry and zeal, good home-conditions, docility, inclination for "bookish" pursuits, freedom from illness, conformity to the school routine, these and other factors play their rôle. The point is, however, that these conditions are relatively accessible to modification

and control, whereas native ability, in the nature of the case, is a primary and uncontrollable prerequisite for school success. It follows that the determination of the general intellectual status cannot be neglected, even though some pupils of moderate ability are able to get higher marks than other pupils of superior ability.

In the actual administration of the Binet tests there arise several important questions. One of these, in particular, has aroused considerable debate. Must these tests be administered by a specially trained expert or may they be administered by any classroom teacher? On this point there is disagreement. Our opinion is between the extreme views. We should recommend the employment wherever possible of an expert psychologist who has had experience, not alone in the psychological laboratory, but also in the conduct of mental tests generally, and who is also familiar by personal contact with the various forms of mental deficiency to be found in institutions for the feeble-minded, who could qualify, in short, as an expert psycho-clinicist.[1] But, where circumstances prevent the employment of an expert psycho-clinicist, we are of the opinion that selected teachers may be trained to perform the most necessary selection of mentally defective pupils with sufficient accuracy to warrant the adoption of this plan. We would recommend that these teachers should be able to present most, if not all, of the following qualifications: (1) at least a general familiarity with the classroom work of the grade schools, (2) a degree of general intelligence better than the average of elementary-school teachers, (3) familiarity with general elementary psychology, educational psychology, and, preferably also, experimental psychology, (4) familiarity with the main aspects of personal hygiene and of school hygiene (with special emphasis upon physical defects and their relation to mentality), (5) knowledge of the history, aims, methods, and results of the special classes for mentally defective children as operated in public schools, (6) special drill in the administration of mental tests, including the technique of the Binet scale, and knowledge of the principal proposals for its modification and extension, (7) personal observation of numbers of feeble-minded children

[1] The proper qualifications for psycho-clinical work have been set forth at length by J. E. W. Wallin, whose views may be taken as an example of those who would restrict diagnostic work with mental tests to persons of quite varied and exceptional training and experience.

as gathered in institutions for mental defectives.[1] Opportunities to secure this special training are now offered by a number of universities, particularly in their summer-school courses. It is also gratifying to note that several of the institutions for the care of the feeble-minded are opening their classes for observation and practice work to limited numbers of properly qualified teachers and supervisors of special classes for mental defectives. We would recommend that school boards directly or indirectly subsidize selected teachers to enable them to secure adequate training in this field.

Another question often debated is: Which of the numerous formulations of the Binet tests should be used? In our opinion, for the purposes of such classification as is here recommended, little or no difference will appear in the results from the use of different formulations. When the basal year is ten or over, we incline to favor the arrangement of the tests proposed by Kuhlmann or by Terman (known as the Stanford revision) rather than the earlier and more frequently used "standard method" published by Goddard, simply because a number of the modifications tentatively introduced by the last-named have been found to be undesirable. Yet the Goddard formulation has the merit of greater ease in handling and administering. It is, moreover, in more common use than the others. Its results are equally good for ages under ten. The *Teachers' Manual* prepared by Professor R. A. Schwegler (14), and published by the School of Education of the University of Kansas, has also an excellent account of this scale and a verbatim set of directions for its conduct.

Whatever arrangement of the scale is used, there are certain general directions for testing that are important if standardized results are to be obtained. The following may be deemed especially essential:

[1] These recommendations accord with the resolution adopted by the American Psychological Association, at its Chicago meeting, December, 1915, deprecating the use of mental tests for purposes of practical diagnosis by persons psychologically unqualified for such work. Since the purport of this resolution has been wrongly stated in certain newspapers, where it has been declared that the American Psychological Association "put its ban on the Binet tests," it would seem not inappropriate here to warn school officials against supposing that the Binet scale has been officially discredited by professional psychologists and against supposing that any person, regardless of training, is competent to apply the scale and either to commend or condemn it.

1. *Isolation.*—Conduct the test individually in a quiet, well-lighted room, free from interruption, and without the presence of parents, teachers, or other children. An assistant, who shall record all responses verbatim, may be used to advantage when time is to be economized.

2. *Preliminary observation.*—Don't start the testing at once, but take a few minutes to get acquainted with the child and to disarm suspicion or timidity. We have found it useful to measure weight, height, vital capacity, strength of grip, vision, and even hearing (quite roughly), and with younger children to try the form-board. These physical tests are directly interesting to the child and they often reveal to the examiner physical defects that account for what seems to be mental insufficiency. Naturally, this preliminary observation must not be long enough to wear out the child before the Binet tests are begun.

3. *Encourage.*—Avoid anything that suggests an inquisition. Never show impatience. Never ridicule. Be tactful and sympathetic. Never correct the child. Never state flatly that his answers are wrong.

4. *Avoid pumping.*—Amateurs almost invariably read into the child's responses their own knowledge. In consequence, they proceed to "pump" the right answer out by hinting, suggesting, and quizzing: "You mean thus and so, don't you?" "Isn't it really this?" etc.

5. *Follow directions.*—The besetting sin of the amateur tester is his proneness to modify the conditions of administering the tests. It cannot be said too emphatically that the primary rule in the use of mental tests is: "Follow directions." Put negatively, if the slang be permitted: "Don't monkey with your method." In especial, don't alter the instructions given to the child in the tests.

6. *Sidelights.*—Be on the watch for the numerous indirect indications of the child's mental processes. To the skilful examiner the attitude and manner of the child will convey valuable hints supplementary to the actual replies. Make full notes on the record blank of these accessory symptoms of mentality.

7. *Order of tests.*—Begin with a number of relatively simple tests. The pictures and the definitions, for example, are always interesting and frequently supply the examiner at the outset with an approximate notion of the child's status. Do not follow strictly the order on the record blank. Intersperse difficult with easy tests.

8. *Range of testing.*—The narrowest range permissible is from the lowest age at which all the tests are passed to the highest age at which

any single test is passed. If the results show considerable irregularity (much "scattering"), it will be necessary to widen this range.

9. *Recording.*—If no stenographic or clerical assistance is feasible, make the attempt, nevertheless, to set down, as soon as it is made, a full record of the child's responses. It is impossible to fill these in later from memory. Moreover, it frequently becomes desirable to know afterward, not merely that the child passed or failed in a given test, but just precisely what his response was.

10. *Anamnesis.*—It is usually worth while to record a tolerably full account of the child's personal history, since it is impossible to be sure that this information will not be wanted afterward in dealing with the case. The following items are recommended: (*a*) child's name in full, (*b*) sex, (*c*) date of birth, (*d*) name of school, (*e*) school grade, (*f*) date and hour of examination, (*g*) name of examiner, (*h*) name of person proposing the examination, (*i*) name of teacher, (*j*) names and addresses of parents, (*k*) occupation of parents, (*l*) number of children in family and their sex, (*m*) illnesses of pupil, (*n*) obvious physical defects or peculiarities, (*o*) conduct in school, (*p*) proficiency in school,(*q*) other items pertinent to the child in question.[1]

REFERENCES

(NOTE.—These references are restricted in the main to the articles referred to in this report. For a full bibliography of the Binet tests, up to 1914, consult Kohs; for an extended presentation of the present status of psycho-clinical work and of the organization of special classes consult Wallin and Goddard.)

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CONSTITUTION OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

(Revision Adopted in Chicago, February, 1909)

ARTICLE I

Name.—The name of this Society shall be "National Society for the Study of Education."

ARTICLE II

Object.—Its purposes are to carry on the investigation and to promote the discussion of educational problems.

ARTICLE III

Membership.—SECTION 1. There shall be three classes of members—active, associate, and honorary.

SEC. 2. Any person who is desirous of promoting the purposes of this Society is eligible to active membership and shall become a member on approval of the Executive Committee.

SEC. 3. Active members shall be entitled to hold office, to vote, and to participate in discussion.

SEC. 4. Associate members shall receive the publications of the Society, and may attend its meetings, but shall not be entitled to hold office, or to vote, or to take part in the discussion.

SEC. 5. Honorary members shall be entitled to all the privileges of active members, with the exception of voting and holding office, and shall be exempt from the payment of dues.

A person may be elected to honorary membership by vote of the Society on nomination by the Executive Committee.

SEC. 6. The names of the active and honorary members shall be printed in the *Yearbook*.

SEC. 7. The annual dues for active members shall be $2.00 and for the associate members $1.00.

ARTICLE IV

Officers and Committees.—SECTION 1. The officers of this Society shall be a president, a vice-president, a secretary-treasurer, an Executive Committee, and a Board of Trustees.

SEC. 2. The Executive Committee shall consist of the president and four other members of the Society.

SEC. 3. The president, vice-president, and secretary-treasurer shall serve for a term of one year. The other members of the Executive Committee shall serve for four years, one to be elected by the Society each year.

SEC. 4. The Executive Committee shall have general charge of the work of the Society, shall appoint the secretary-treasurer, and may, at its discretion, appoint an editor of the *Yearbook*.

SEC. 5. A Board of Trustees consisting of three members shall be elected by the Society for a term of three years, one to be elected each year.

The Board of Trustees shall be the custodian of the property of the Society, shall have power to make contracts, and shall audit all accounts of the Society, and make an annual financial report.

SEC. 6. The method of electing officers shall be determined by the Society.

ARTICLE V

Publications.—The Society shall publish *The Yearbook of the National Society for the Study of Education* and such supplements as the Executive Committee may provide for.

ARTICLE VI

Meetings.—The Society shall hold its annual meetings at the time and place of the Department of Superintendence of the National Education Association. Other meetings may be held when authorized by the Society or by the Executive Committee.

ARTICLE VII

Amendments.—This constitution may be amended at any annual meeting by a vote of two-thirds of voting members present.

MINUTES OF THE MEETING OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION AT CINCINNATI, OHIO, MONDAY, FEBRUARY 22, 1915

An audience of some five hundred persons assembled in one of the ballrooms at the Sinton Hotel in order to hear the discussion of Part I of the *Fourteenth Yearbook* of the Society, while some two hundred persons were turned away, owing to the fact that the room was filled. This unusually large number was due to the fact that the Yearbook entitled *Minimum Essentials in Elementary-School Subjects* made such a wide appeal and to the fact that it represented the co-operative efforts of the National Society for the Study of Education and the Committee on Economy of Time of the National Education Association.

President J. M. Gwinn called the meeting to order at 8:00 o'clock, and presided during the progress of the following program:

Topic: "Minimum Essentials in Elementary-School Subjects." General Statement of the Scope of the Yearbook.

J. M. GWINN, Superintendent of Schools, New Orleans, La.

"The Essentials in Language and Literature"

JAMES FLEMING HOSIC, Head of Department of English, Chicago Normal College, Chicago, Ill.

"Objective Standards for Controlling Instruction and Economizing Time"

S. A. COURTIS, Director of Educational Research, Public Schools, Detroit, Mich.

"Standard Requirements in Handwriting"

F. N. FREEMAN, Assistant Professor of Education, University of Chicago, Chicago, Ill.

Discussion:

G. D. STRAYER, Professor of Educational Administration, Teachers College, Columbia University, New York, N.Y.

F. E. SPAULDING, Superintendent of Schools, Minneapolis, Minn.

The report of the nominating committee was presented and the following officers elected: President, Superintendent R. J. Condon, of Cincinnati; Vice-President, Professor J. Carleton Bell, University of Texas; Member of Executive Committee for the term expiring in 1919, President Dwight B. Waldo, of the Western State Normal School, Kalamazoo, Mich.; Member of the Executive Committee to fill the vacancy caused by the resignation of Superintendent H. C. Morrison, Superintendent Harry B. Wilson, of Topeka,

Kan.; Member of the Board of Trustees, Professor S. Chester Parker, University of Chicago.

At approximately 10:00 o'clock the chairman adjourned the meeting, which had proved to be especially successful, largely owing to the fact that each speaker was thoroughly well prepared and spoke exactly the length of time that had been assigned him.

S. CHESTER PARKER, *Secretary*

J. M. GWINN, *President*

FINANCIAL REPORT OF THE SECRETARY-TREASURER OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

DECEMBER 23, 1914, TO DECEMBER 23, 1915

RECEIPTS FOR 1915

Balance on hand December 23, 1914			$1,087.28
From sale of *Yearbooks* by The University of Chicago Press:			
June to December, 1914	$347.49		
January to June, 1915	912.97	$1,260.46	
Interest on savings bank account:			
To January 1, 1915	$ 12.98		
To July 1, 1915	6.25	19.23	
Dues from members (current and delinquent):			
Active	$387.80		
Associate	219.30		
		$607.10	
Total income for the year			$1,886.74
Total receipts including initial balance			$2,974.07

EXPENDITURES FOR 1915

Publishing and distributing "Yearbooks":		
Printing *Fourteenth Yearbook*, Part I ("Minimum Essentials")	$499.69	
Distributing *Fourteenth Yearbook*, Part I, to members	35.54	
Printing 1,200 additional copies *Fourteenth Yearbook*, Part I	184.50	
Printing *Fourteenth Yearbook*, Part II ("Teachers' Efficiency")	239.19	
Distributing *Fourteenth Yearbook*, Part II, to members	25.13	
Printing 1,000 additional copies *Twelfth Yearbook*, Part I ("Supervision of City Schools")	79.36	
Printing 1,015 additional copies *Fourteenth Yearbook*, Part II	76.10	
Miscellaneous expenses preparing *Yearbooks*	20.13	
Distributing *Yearbooks* to members, miscellaneous	9.77	
Total cost of *Yearbooks*		$1,169.41
Carried forward - - - - - - - -		1,169.41

Brought forward - - - - - - - - -		$1,169.41
Secretary's office:		
Secretary's salary from end of Richmond meeting, February, 1914, to end of Cincinnati meeting, February, 1915	$100.00	
Secretary's traveling and hotel expenses for Cincinnati meeting	49.10	
Typewriting	21.20	
Bookkeeping	31.25	
Stamps	30.00	
Stationery	17.85	
Telegrams	5.31	
Exchange	6.70	
Total for Secretary's office		261.41
Total expenses		$1,430.82

SUMMARY

Total expenditures for 1915		$1,430.82
Balance on hand December 23, 1915: Savings account		1,292.13
Balance on hand December 23, 1915: Checking account		251.12
Total		$2,974.07

MEMBERSHIP

Number of active members (including one honorary) December 23, 1915	195
Number of associate members December 23, 1915	242
Total membership	437

GUY M. WHIPPLE, *Secretary-Treasurer*

LIST OF ACTIVE AND HONORARY MEMBERS OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

(Corrected to January 15, 1916)

HONORARY MEMBERS

Dewey, John, Columbia University, New York, N.Y.

ACTIVE MEMBERS

Allen, Fiske, State Normal School, Charleston, Ill.
Arbaugh, W. B., Ypsilanti, Mich.
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Axline, Howard E., West Technical High School, Cleveland, Ohio.
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THE FIFTEENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

PART II

THE RELATIONSHIP BETWEEN PERSISTENCE IN SCHOOL AND HOME CONDITIONS

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS
1916

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THE FIFTEENTH YEARBOOK

OF THE

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PART II

THE RELATIONSHIP BETWEEN PERSISTENCE IN SCHOOL AND HOME CONDITIONS

BY

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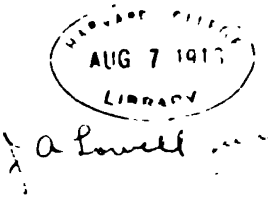

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EDITOR'S PREFACE

In this part of the *Fifteenth Yearbook* Dr. C. E. Holley presents the results of a direct investigation on a fairly comprehensive scale of the important question: What factors determine the number of years of schooling received by pupils of the public schools? The investigation was carried on in several Illinois cities; the results are doubtless typical for the Middle West, if not for the country generally. It will be noted that the outcome of the study coincides in some respects with beliefs current in educational circles, but contradicts those beliefs in other respects. A close correlation is discovered between years of schooling and the economic, social, and educational advantages of the homes from which the pupils come, and these environmental conditions appear to be more important than degree of native ability in determining amount of schooling. Retardation and truancy are most frequent among the children of poor and uneducated parents. Size of family, however, has no appreciable effect on persistence in school. Of particular interest to schoolmen is the demonstration that early elimination is largely due to external factors over which the school has little or no control. The selected bibliography on elimination and related issues found at the end of the text will, it is hoped, be useful to readers of the *Yearbook*.

G. M. W.

THE RELATIONSHIP BETWEEN PERSISTENCE IN SCHOOL AND HOME CONDITIONS[1]

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PART I

INTRODUCTORY STATEMENT

THE PROBLEM

This study is concerned primarily with the qualitative analysis of the relationships which exist between the schooling of children and their home conditions. It is concerned secondarily with a rough determination of the relative importance of the hereditary and the environmental factors involved in these relationships.

ORIGIN AND DEVELOPMENT OF THE STUDY

The study is an outgrowth of a social survey of the Decatur, Illinois, high school made by the writer during the school year of 1912–13. In making this survey a large amount of data was secured, most of which proved to be of relatively little importance, but among the many facts there were a few which suggested family tendencies in the matter of educating children. Some of the families gave all the older children a high-school education, while other families, of similar size and age-composition, did not have one child who had completed the high-school work. All the families having two or more children no longer in the public school were selected and examined. There proved to be 198 such families, containing 642 older children, 334 of whom had secured a high-school education. A further examination showed that 40 per cent of the 198 families furnished 72 per cent of those who had finished the high school, and 30 per cent of the families furnished 57 per cent of those who

[1] This study was accepted as the dissertation for the doctorate of philosophy in education by the Graduate School of the University of Illinois. The writer wishes to acknowledge his indebtedness for counsel and suggestions given by Dr. W. C. Bagley and Dr. L. D. Coffman. Further, many useful suggestions were received from Dr. G. M. Whipple, Dr. C. H. Johnston, and the graduate students in education.

had not finished the high school. This difference suggested that there must be corresponding differences in the homes which might be ascertained. Data were secured and it was found that these two groups of homes differed markedly with respect to economic, educational, and social conditions.

Three years ago Dr. J. K. Van Denburg published the results of an investigation conducted in the New York City schools. He found that "on the whole, the economic status of these pupils (so far as it is shown by monthly rental) seems to be only a slight factor in the determination of length of stay in the high schools. The one most marked influence seems to be that the superior economic status in girls leads to a longer stay in spite of failure to progress at the 'normal' rate."[1]

At another place Dr. Van Denburg shows[2] (Table I) the percentages of the different rental groups[3] who graduated from the high school which

TABLE I

PERCENTAGE GRADUATING, CLASSIFIED ACCORDING TO RENTAL GROUPS

Amount	Graduates	Total Entering	Percentage Graduating
Boys			
Not specified.....	22	.....	.....
$ 8 to $17.....	9	76	11.8
$18 to $27.....	8	34	23.5
$28 and up.....	4	48	8.3
Girls			
Not specified.....	40	.....	.....
$ 8 to $17.....	14	99	14.1
$18 to $27.....	10	71	14.0
$28 and up.....	4	65	6.1

they entered four years earlier. He, however, has no record of those who left the public schools and went to private schools, a group mentioned as a factor of some importance. Hence the group "28 and up," would

[1] *Causes of the Elimination of Pupils in Public Secondary Schools* (New York: Published by Teachers College, 1912), p. 113.

[2] *Ibid.*, p. 134.

[3] A rental group is a group of families which paid specified amounts of rent per month. All the families selected were divided by Van Denburg into three rental groups: (1) those paying $8 to $17 per month, (2) those paying $18 to $27 per month, and (3) those paying $28 or more per month.

have to be augmented by an unknown quantity to represent the true percentage of those who received the equivalent of four years in the public high school. It is conceivable that this unknown quantity would be large enough to show a definite relationship for the boys between economic status and persistence in school. With the girls the case would not be so clear, for the two smaller groups contain the same percentage of graduates. It may be that the economic factor is of less importance with girls than with boys.

To be conservative, it might be said that the economic status of the families in Dr. Van Denburg's study is not of sufficient importance to overshadow or more than counteract other factors which make for persistence in, or elimination from, the public high schools of New York City. He has shown that the presence or absence of younger children in the family, the nationality of the parents, choice or lack of choice of an occupation, and intention with regard to graduation are factors correlated with the length of stay in the high school. A more detailed study of home conditions might reveal other factors of far greater influence in this city than economic status.

In another study[1] Dr. C. H. Keyes showed that acceleration or retardation were characteristic of certain families. He found that 6.8 per cent of the families produced 24 per cent of the accelerates, while 7.7 per cent of the families produced 24.5 per cent of the arrests. These facts obtained in a New England city tend to support those obtained in Decatur.

The apparent disagreement between the conditions found by Dr. Van Denburg in New York City and those found by the writer in Decatur, Illinois, raised the question: "Is Decatur representative qualitatively of the average middle western city?" With this question in mind it was decided to extend the study to other Illinois cities, and information was collected from the high schools of Centralia, Champaign, Gibson City, and Rochelle, Illinois. While these data were being collected, it occurred to the writer that this study dealt with a special class—those whose children reached the high school—and represented a special situation, and hence that it ought to be extended so as to include statistics from all levels of society. Accordingly the families residing in Urbana who had children between the ages of fourteen and twenty-one were selected, and

[1] C. H. Keyes, *Progress through the Grades of City Schools* (New York: Published by Teachers College, 1911).

a personal canvass was made by the writer which furnished a mass of facts from 234 homes. When these data had been tabulated and evaluated, and an interpretation was attempted, it was found that, although important relationships existed between the amounts of schooling that the children received and certain objective home conditions, it was impossible to distinguish between environmental and hereditary factors, a distinction that is very important from social and educational points of view. In order more accurately to determine the relative importance of these two types of factors it was decided to secure similar facts about the education and home conditions of adopted children.

In outline this presents the origin and development of the study. The presentation of the data will follow the same general order.

THE DATA

Sources.—The facts presented in Part II were secured from the high-school pupils of Decatur, Illinois, during the fall of 1912. Those in Part III were collected from the high-school pupils of Centralia, Champaign, Gibson City, and Rochelle, Illinois, during the fall of 1913. The main data, those in Part IV, were gathered directly from the homes and from the courthouse records in Urbana, Illinois, during the summer and fall of 1914. The information about the adopted children, given in Part V, was secured from the Urbana courthouse records and from various individuals who resided in Champaign and Urbana during the early months of 1915.

Method of collecting.—The original data which uncovered the problem were secured from the high-school pupils of Decatur during the fall of 1912. One morning in November the writer called at the school with a supply of blanks asking the following questions, as well as a number of others which had no bearing on the present problem:

Name.....Sex.....Age.....
Country of your mother's birthplace.....
Country of your father's birthplace.....
What language is commonly spoken in your home?.....

OLDER BROTHERS

No.	Age	Has he finished high school?	What is he doing now?
1.			
2.			
3.			
4.			
5.			

OLDER SISTERS

No.	Age	Has she finished high school?	What is she doing now?
1.			
2.			
3.			
4.			
5.			

The teachers were instructed briefly as to the facts desired and the collection of data was then left in their hands. The first period of the morning was used and each of the pupils attending at that time was required to fill out one of the blanks. Through the assistance given by the room-charge teachers the entire high school furnished the desired information in a short time.

After it was discovered that one group of homes educated its children more than the other group, it was thought that an objective description of these homes might be secured from the children who attended high school. For this purpose a blank was prepared asking for the following data:

a) Father's occupation.....
b) Father's education..... mother's education.....
c) What is the family income?.....
d) What rent does the family pay per month (estimated by the kind of house in which they live)?.....
e) Church affiliation of father.....of mother.....
f) What newspapers does the family take?.....
What magazines?.....
g) What is the size of the family library?.....
h) What clubs or organizations does the father attend?.....
.....
The mother?.....

These blanks were given to the pupils from the selected homes and were filled out in conference with the teachers or principal. The results were later checked up by the principal, and reports containing obvious errors were marked so that the erroneous portions could be eliminated.

As stated earlier, the facts reported in Part III were secured from the high-school pupils of Centralia, Champaign, Gibson City, and Rochelle, Illinois. A blank asking for the following information was used.

Name.....Sex.....
1. Country of mother's birth.....
2. Country of father's birth.....
3. Father's occupation.....
4. Father's education (in years of schooling).....
5. Mother's education (in years of schooling).....
6. What monthly rent do your parents pay for the house in which they live? (If they own their home, estimate the rent by comparing with rented houses in the neighborhood.).....
7. How many volumes in your home library?.....

OLDER BROTHERS			OLDER SISTERS		
No.	Age	Education in years of schooling	No.	Age	Education in years of schooling
1.			1.		
2.			2.		
3.			3.		
4.			4.		
5.			5.		

Copies of this were sent to the principals or superintendents of Centralia, Gibson City, and Rochelle, and they secured the information from the pupils as best they could. In Gibson City this method resulted in returns from all the pupils attending on the day the information was secured. In Centralia and Rochelle less pressure was put upon the pupils and some failed to furnish any information. In Champaign the writer gathered the data during the English class periods, personally directing the work of the pupils. By answering any queries which arose because of a misunderstanding of any of the questions and by suggesting ways of estimating some of the items, he secured careful replies from almost all the pupils. They were told that it was not necessary for them to sign their names. Hence it was easy to meet any objections which a pupil might have to answering personal questions, and all the pupils filled out the blanks. In the other three towns the pupils signed the blanks, a fact which made them a little more reserved in their replies.

The information which forms the basis of Part IV was secured through a personal canvass made by the writer during June and July, 1914, in Urbana. The university-community portion of the town is a students' residence district and education is a thing uppermost in the minds of those who live there. It contains many families who have moved to Urbana to educate their children. Because of this emphasis on education and because of the difficulty of gauging an economic index where there are so many temporary residents, all families who lived west

of Coler Street and south of Springfield Avenue were eliminated from consideration. The families of the university faculty who lived outside of this area were also eliminated. The preliminary list of names was secured from the 1913 school census records, which gave every home containing an individual under twenty-one years of age. The list finally selected was restricted to those homes which included individuals fourteen to twenty-one years of age, and contained about 550 names. When the actual canvass was made, it was found that a few of these homes contained no children over fourteen (roomers under twenty-one years of age having been found by the school census taker and recorded) and that a few of the listed families had moved out of town. These two factors reduced the list of possible calls to slightly less than 500. The writer called at the homes on all the east and west streets (most homes in Urbana face these streets). Sometimes no one was at home. When convenient a second or even a third call was made to secure the desired information. The canvass resulted in securing information from 234 homes of whites and 5 homes of colored people and gave a random sampling of the community. The colored homes are not included in the study because their members belong to a race which is not as yet a homogeneous element of the population. Their number was too small to be studied separately. As an aid and guide in securing the information the following blank was used:

1. Occupation of father.....
2. Country of father's birth..... of mother's birth.....
3. Father's native language..... mother's native language.....
4. Education of father.....of mother.....
5. Number of books in the home.....
6. Number of living-rooms in home.....
7. Number of people living in house over fourteen years of age.....
   Under fourteen years of age.....
8. Number of members of family living at home.....
9. Rent per month.....
10. Children above fourteen years of age.....

	Sex	Age	Years of schooling each has received
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

In conducting the canvass, the writer, after introducing himself, usually began with an inquiry as to the number of children in the home, their age, and education. Experience showed that parents were quite ready to talk about their children and that, after getting somewhat acquainted with the writer, they were then more free in answering the other questions. By this procedure the facts were secured to question No. 10 first and then the blank was filled out in order, beginning with question No. 1.

The figures for the personal property and real estate assessments were taken from the courthouse records giving the assessments for the 1915 taxes. In case a name did not appear here, the previous year's records were examined. In a few cases the figures were obtained in the latter way.

The data which furnish the basis for the discussion of adopted children, presented in Part V, were gathered by the writer through a personal canvass. The original list of names was secured from the court records which gave the adoptions made in Champaign County since 1871. From these records the sex, date of birth, date of adoption, names of foster-parents with their town addresses, the changed name of the child, and cause of adoption were secured for each child. Excluding all children who would not now be at least fourteen years old, the list contained 155 cases of adoption. The present addresses of as many as possible of these foster-parents, of the children, or of someone who could give the desired information were secured from directories and from people who have long resided in Champaign or Urbana. That the results might be comparable with those presented in Part IV, only those parents who lived in Champaign or Urbana and reared the children there were included in the study.

In securing these data a form quite similar to that used in the earlier canvass was employed. It was as follows:

Parents' names.....
1. Occupation of father.....
2. Nativity of father.....of mother.....
3. Schooling of father (in years).....of mother.....
4. Estimated number of books in home.....
5. Financial status of parents: very poor, poor, average, well-to-do, wealthy (check).
6. Estimated rent of home in which family lived when children were in school.....
7. Facts about all children living or dead, who reached fourteen years of age.....

	Date of birth	Sex	Schooling in years
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

The procedure was approximately the same, after the list of names and addresses was secured, as that followed in gathering the data for Part IV. Members of the family or relatives furnished the information for all but one of the children studied.

Errors.—The data secured from the pupils through questionnaires which they themselves filled out were probably more inaccurate than those secured by the writer through the personal canvass. The greatest constant error is that of omission. It is thought by the writer that the effect of this is nearly that of pure chance, though this may be proved otherwise if carefully investigated. However, since this is primarily a qualitative study, such errors will be less serious than if it were a purely quantitative investigation. Wilful untruths may have existed in the data, but they were very rare. From the nature of the questions and the conditions under which they were answered, some of the data are estimates, more or less inaccurate. Errors peculiar to one kind of data will be mentioned during its discussion.

Method of treatment.—The statistical method[1] will be used in this study. All the important relationships will be expressed through coefficients of correlation. All correlations will be worked according to the "product-moment" method of Pearson where $r = \frac{\Sigma xy}{n \sigma_1 \sigma_2}$. The reliability of all correlations will be expressed according to the formula $P.E. = 0.6745 \frac{1 - r^2}{\sqrt{n}}$. The reliability of the difference between two medians will be expressed according to the formula $P.E.D. = \sqrt{\frac{P.E._1^2}{n_1} + \frac{P.E._2^2}{n_2}}$. All central tendencies will be expressed by medians.

[1] All the formulas used can be found in any standard work on statistical methods. See Thorndike, *Mental and Social Measurements;* or Whipple, *Manual of Mental and Physical Tests,* 2d ed., Part I, "Simpler Processes." Whipple gives on p. 35 a table showing the reliability of *P.E.* according to its relative size.

PART II

RELATIONSHIPS FOUND IN DECATUR

The original data collected in Decatur during the fall of 1912 revealed 198 children from homes having two or more older children no longer in the public school. These homes when examined could be distributed readily among three groups: (I) those from which all the older children had completed the high-school work; (II) those from which none of the older children had completed the high-school work; (III) those in which some of the older children had graduated from the high school and others had not.

In all there were 642 older brothers and sisters, 334 of whom had secured a high-school education. Group I contained 78 families and furnished 72 per cent of the 334 children. Group II contained 59 families and furnished 57 per cent of the 308 who had not finished high school.

This section will be devoted to a discussion of the differences between home conditions in the first two groups.

The replies were most nearly complete with respect to the education of the parents, though a few children failed to give this information. When the replies were checked, it was found that some information was secured concerning 60 homes of Group I and 43 homes of Group II. On some of the blanks there was very little information, probably because the pupils, or even the parents in some cases, could not give the facts desired.

RESULTS OF THE INVESTIGATION

The differences between the two types of homes are striking.

a) *Occupations.*—The fathers of Group I (the families that gave their children a high-school education) are chiefly engaged in professional and commercial occupations (see Table II). The fathers of Group II (the families that did not provide a high-school education for their children) are chiefly engaged in artisan trades, and in semi-skilled and unskilled occupations (Table II).

b) *Schooling.*—The median number of years of schooling received by the parents of Group I is twelve; by the parents of Group II, eight

(see Table III). In Group I, 60 per cent of the fathers and 61 per cent of the mothers have had the equivalent of a high-school education,

TABLE II

OCCUPATIONS OF FATHERS

GROUP I		GROUP II	
Occupation	No.	Occupation	No.
Farmer	8	Farmer	6
Lawyer	4	Retired farmer	3
Insurance	4	Carpenter	3
Real estate dealer	3	Minister	3
Retired farmer	2	Blacksmith	3
Physician	2	Cabinet-maker	2
Public official	2	Night watchman	2
Jeweler	2	Janitor	2
Cashier	2	Railroad engineer	1
Minister	2	Railroad conductor	1
Implement dealer	1	Mail clerk	1
Druggist	1	Shoeman	1
Millwright	1	Lock-maker	1
Business	1	Factory employee	1
Painter and decorator	1	Boiler-maker	1
Floor-walker	1	Clothier	1
Nurseryman	1	Gardener	1
Mason	1	Cement contractor	1
Railroader	1	Commission dealer	1
Music store	1	Horse-dealer	1
Brick business	1	Grocer	1
Bookkeeper	1	Miller	1
Auto trimmer	1	Clerk	1
Proprietor, machine-shop	1	Passenger engine inspector	1
Hotel-keeper	1		
Machinist	1		
Cement factory	1		
Carpenter	1		
Secretary and treasurer	1		
Barber	1		
Furnaceman	1		
Railroad engineer	1		

while more than 91 per cent of the fathers and mothers of Group II have had less than four years of high-school work. Indeed, 74 per cent of

the fathers and 71 per cent of the mothers of Group II did not go beyond the eighth grade. The mathematical differences between the medians of the two groups, 3.68±0.38 years for fathers and 3.70±0.38 years for mothers, have a high degree of reliability.

TABLE III

THE EDUCATION OF FATHERS AND MOTHERS

NUMBER OF YEARS OF SCHOOLING	GROUP I		GROUP II	
	Fathers	Mothers	Fathers	Mothers
2	.....	.....	1	.....
3	.....	.....	.....	.....
4	.....	.....	.....	.....
5	.....	.....	.....	1
6	2	.....	.....	.....
7	2	.....	1	3
8	11	12	24	21
9	.....	1	.....	.....
10	5	6	4	4
11	.....	.....	2	3
12	15	16	1	2
13	4	2	.....	.....
14	5	11	2	1
15	1	.....	.....	.....
16	3	1	.....	.....
18	2	.....	.....	.....
Median years of education	12.33 years	12.34 years	8.65 years	8.64 years

Difference between median education of Groups I and II, fathers=3.68±0.38 years

Difference between median education of Groups I and II, mothers=3.70±0.38 years

c) *Incomes and rent.*—As would readily be inferred from the facts concerning occupation and schooling just presented, the yearly incomes and monthly rentals are higher with those who sent their children through the high school than with the other group. The median yearly income of Group I is $2,000; of Group II, $1,350 (Table IV). Each family studied in this section contained at least three children, and the average is almost five. Thus it seems that the problem of furnishing the necessaries of life must be a serious one for many families of Group II.

The differences between the rental values of the two groups of homes are evident to one who simply glances at Table V. Statistically they are shown by the difference in the medians. They are marked, for 81 per

TABLE IV

INCOMES*

	Group I	Group II		Group I	Group II
Below $699	.....	2	$1,800 to $1,899	.....	2
$ 700 to $ 799	1	3	1,900 to 1,999	1	1
800 to 899	1	3	2,000 to 2,099	1	1
900 to 999	1	2	2,100 to 2,199	.....	.....
1,000 to 1,099	3	3	2,200 to 2,299	.....	1
1,100 to 1,199	.....	1	2,300 to 2,399	.....	.....
1,200 to 1,299	6	1	2,400 to 2,499	.....	1
1,300 to 1,399	1	1	2,500 to 2,599	3	1
1,400 to 1,499	.....	2	3,000 to 3,999	5	1
1,500 to 1,599	2	3	4,000 to 4,999	5	.....
1,600 to 1,699	2	1	5,000 and above	5	.....
1,700 to 1,799	1	1	Median income	$2,000	$1,350

Difference between medians of Group I and II = $650 ± $242

* A number of families had such indefinite incomes that the parents themselves could not estimate them.

cent of the families in Group I pay $25 or more a month while 77 per cent of Group II pay less than this amount. A house with modern improvements, bath, toilet, etc., large enough for a family of six costs

TABLE V

RENTAL VALUES OF HOMES*

Per Month	Group I	Group II	Per Month	Group I	Group II
$10	.....	1	$20	1	11
11	.....	.....	22.50	1	1
12	.....	.....	25	10	4
13	.....	2	30	6	.....
14	.....	1	35	4	2
15	1	3	40	5	1
16	1	1	50	1	.....
17	1	1	Median rent	$30	$20.80
18	1	3	No. who own their homes	14	9
19	.....	.....			

Differences between medians of Groups I and II = $9.20 ± $1.17

*The question which asked for this information was poorly constructed. It was: "What rents does the family pay per month (estimated by the kind of a house in which they live)?" Some replied by merely stating that they owned the home. Others estimated the rent even if they owned the home.

at least $25 a month in Decatur. Hence a large part of the families of Group II live in somewhat undesirable houses. The number reported

TABLE VI

NEWSPAPERS TAKEN

	Group I	Group II
Decatur papers	77	55
Chicago papers	15	5
Other local papers	8	2

as owning their homes, 14 families of Group I and 9 families of Group II, is too small to be a basis for any significant conclusions.[1]

TABLE VII

MAGAZINES TAKEN

	Group I	Group II
Ladies' Home Journal	23	20
Woman's Home Companion	13	5
Saturday Evening Post	11	1
Cosmopolitan	9	2
Pictorial Review	7	3
Youth's Companion	6	4
Good Housekeeping	6	2
Popular Mechanics	6	1
Literary Digest	6	.....
Everybody's	5	2
Religious papers	4	4
Collier's	4	3
McClure's	4	1
Woman's World	3	6
Farm papers	2	3
Motor Age	2	.....
Life and *Judge*	2	.....
Review of Reviews	1	1
Boys' paper	1	.....
Home-Life	1	.....
Current Events	1	.....
Success	1	.....
Travel	1	.....

d) Home culture.—There is only a slight relationship between the number of newspapers taken by a home and the schooling and financial standing of the parents (Table VI). Every home in both groups took

[1] The difference between the median rents of the two groups is much more reliable than the differences between median incomes. The latter is barely large enough to justify statistical consideration.

a daily newspaper with one exception, a home of Group I. This home took several magazines.

The two groups of homes showed a much greater difference when the quantity and quality of the periodical literature were examined. Magazines of the better class were found in the homes represented by Group I, but were very infrequently found in the homes of Group II (Table VII).

The library facilities of the two groups of homes correspond to the other characteristics already discussed. The median number of books found in homes of Group I was 271; in Group II, 83 (Table VIII). In other words, the average home of Group I had more than three times as many books in it as the average home of Group II. All but one of the homes of Group II, or 97 per cent, had smaller libraries than the average home of Group I.

TABLE VIII

LIBRARIES

Volumes	Group I	Group II	Volumes	Group I	Group II
Less than 50	4	10	301–400	7	.....
51– 75	.....	6	401–500	1	.....
76–100	2	5	501 and over	6	1
101–200	6	12	Median number of volumes	271	83
201–300	7	1			

Difference between medians of Groups I and II = 188 ± 24 volumes

e) Clubs and organizations.—The number of clubs and organizations attended by the fathers of Group I was larger than the number attended by the fathers of the other group (Table IX). The fathers of Group I were more often members of those social and recreational societies which are somewhat of an economic burden. Among the mothers the only important difference to be noted is that the mothers in Group I attended the "women's clubs" while mothers in Group II attended the "mothers' club" of the public school.

f) Religious affiliations.—The differences which appeared between the two groups with respect to this point (Table X) were not significant in their bearing upon persistence in school. A more extended study might reveal important facts which did not appear in the small number of cases secured in this study.

TABLE IX

CLUBS AND ORGANIZATIONS ATTENDED BY THE FATHERS AND MOTHERS

	FATHERS		MOTHERS	
	Group I	Group II	Group I	Group II
Masons	17	3		
Woodmen	13	4		
Oddfellows	8	5		
Social or recreational	8		1	
Knights of Pythias	5	2		
Professional	4	3		1
Moose	2	1		1
Chamber of Commerce	1			
Knights of Columbus	1	1		
Trade union	1	6		
Owls		1		
G.A.R.		1		
Rebecca	1	1	3	4
Royal Neighbors		1	6	6
Church societies	1	1	12	8
Court of Honor	1	2	1	1
Ben Hur		2		4
Yeomen	1	1	1	
Women's clubs			8	1
Eastern Star			2	
King's Daughters			1	
Mothers' club			1	6
Y.W.C.A.			1	
W.C.T.U.			1	1

TABLE X

CHURCH AFFILIATIONS OF FATHERS AND MOTHERS

	FATHERS		MOTHERS	
	Group I	Group II	Group I	Group II
Methodist Episcopal	15	17	6	8
Presbyterian	11	12	2	3
Christian	5	6	4	4
Congregational	3	3	2	2
United Brethren	3	3	1	2
Baptist	3	2	6	7
Lutheran	2	3	3	4
Catholic	1	3	2	1
Free Methodist	1	1		
German Methodist	1	1	1	1
Episcopal	1	1		
Christian Science		1		
African Methodist			1	1
Church of God			1	1
Unitarian			1	1
Protestant				1

SUMMARY AND CONCLUSIONS

Seventy-eight families, 40 per cent of those which had two or more older children no longer in the public school, furnish 72 per cent of the 334 high-school graduates.

Fifty-nine families, 30 per cent of those studied, furnished 57 per cent of those who did not finish high school.

As a class, the parents of the first group were better educated, were employed in different occupations, received larger incomes, paid more rent per month or lived in better homes, took a greater number and a better type of magazines and newspapers, had larger libraries, and attended a different type of clubs, organizations, and churches than the parents of the group of families none of whose older children finished high school.

There was, in Decatur, Illinois, a decided relationship between advantages of home conditions and the amounts of schooling which children received.

PART III

RELATIONSHIPS FOUND IN CENTRALIA, CHAMPAIGN, GIBSON CITY, AND ROCHELLE

This section is based on the data secured from the high-school pupils of Centralia, Champaign, Gibson City, and Rochelle. Only the replies of those pupils who reported older brothers or sisters no longer in school were used. This selection reduced the total number of homes studied to 318. An appreciable number of the blanks failed to give all the information desired. A blank might omit the schooling of the father or mother, the rental estimate, the number of books in the home, or the schooling or sex of the older children. In such a case it was not rejected, but the available information which it contained was utilized. Consequently the numbers given in the various tables differ. Thirty-three pupils failed to give estimates of the schooling of their parents, 99 gave no estimate of the monthly rental, and 111 did not report the number of books in the home.

The ratio of the number of homes included in this study to the total population is not the same for each of the four towns. It varies rather widely. Centralia is represented by the smallest number of homes, 37, though it is three-fourths the size of Champaign, which has the largest number, 149. Gibson City and Rochelle are both small places but are well represented.

TABLE XI

POPULATION AND HOMES STUDIED

	Population (1910 Census)	No. of Homes Studied
Centralia	9,680	37
Champaign	12,421	149
Gibson City	2,086	67
Rochelle	2,732	65

These towns are situated in four sections of the state, south-central, central, east-central, and northern. It is thought by the writer that as a group they are representative qualitatively of towns of similar size in this state and probably are representative of this section of the

United States. This fact, however, must remain a matter of opinion until it has been demonstrated by similar studies of other towns.

When an attempt was made to present the relationships separately for each town, it was found that the chance variations present exerted so great an influence that relationships were frequently obscured or exaggerated. Hence it was decided to give only the combined data for the four towns.

This section considers only families which had a child in one of the four high schools at the time the data were secured. It does not touch the larger group whose children never go beyond the eighth grade. This sort of sampling necessarily provides a select class, and the results presented here must not be interpreted in any other light.

RESULTS

The facts toward which attention will be directed are relationships as expressed by coefficients of correlation. Although the data disclose

TABLE XII

CORRELATION OF EDUCATION OF PARENTS AND EDUCATION OF SONS IN CENTRALIA, CHAMPAIGN, GIBSON CITY, AND ROCHELLE

Years of Schooling of Sons	Average Years of Schooling of Parents												
	4	5	6	7	8	9	10	11	12	13	14	15	16
20	....	....	....	....	....	....	....	....	....	....	1	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	....	....	1	2	1	....	....	....	....	....	1	....
17	....	....	....	....	....	....	....	1	....	....	....	....	....
16	....	....	....	....	2	3	2	2	1	3	....	1	
15	....	....	1	1	4	3	....	....	1	1	....	....	1
14	....	....	....	....	4	1	1	3	4	....	....	....	....
13	....	....	....	....	1	1	1	1	2	....	....	....	1
12	....	1	1	5	18	7	10	2	7	5	5	1	1
11	....	2	2	4	10	4	3	2	4	1	....	....	....
10	....	....	2	4	19	7	8	4	....	....	....	1	....
9	1	....	1	7	13	1	4	3	....	....	1	....	....
8	1	7	2	10	38	2	1	5	2	2	....	....	....
7	....	3	2	3	8	2	....	1	....	1	....	....	....
6	....	....	....	....	1	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	1	....	....	....	....	....	....	....	....

$r = .43 \pm .03$

$n = 316$

Median education of sons, 10 years

a number of others, only those existing between the schooling of the children and the schooling of the parents, rental values of the home, and number of books in the home will be presented.

a) Schooling of parents.—It will be noticed when the tables are examined that there is a marked concentration of cases at that point on the scale of the schooling of parents which marks the end of the grammar school. With the children there are two such points, one at

TABLE XIII

CORRELATION OF EDUCATION OF PARENTS AND EDUCATION OF DAUGHTERS IN CENTRALIA, CHAMPAIGN, GIBSON CITY, AND ROCHELLE

Years of Schooling of Daughters	Average Years of Schooling of Parents												
	4	5	6	7	8	9	10	11	12	13	14	15	16
19	....	....	....	....	....	....	....	....	....	....	....	1	....
18	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	1	1	....	1	....	....	....
16	....	....	....	1	1	1	2	2	2	4	2	2	1
15	....	1	....	....	2	1	....	2	1	....	1	....	....
14	....	....	2	....	1	3	4	2	5	1	....	....	2
13	....	....	2	....	3	5	2	5	4	1	1	....	....
12	....	1	3	4	24	10	7	5	4	2	6	3	....
11	....	....	1	1	10	2	1	2	1	2	....	....	....
10	....	....	4	5	11	3	2	3	1	1	1	....	4
9	....	....	....	5	9	3	1	....	....	....	....	....	....
8	1	3	....	11	35	5	5	1	1	1	....	....	....
7	....	1	1	3	5	1	....	....	....	....	....	....	....
6	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	1	....	....	....	....	....	....	....	....	....	....	....

$r = 0.42 \pm 0.03$

$n = 290$

Median education of daughters, 11 years

the end of the grammar school and the other at the end of high school, with possibly a third at the end of college. Such concentrations disturb the curve of distribution and modify conditions somewhat. The relationships between the schooling of the children and the schooling of the parents are approximately the same for both sons and daughters, 0.43 ± 0.03 for the former (Table XII) and 0.42 ± 0.03 for the latter (Table XIII).

b) *Schooling of foreign-born parents.*—Out of the total number of homes, 318, 29 had foreign-born parents and 35, one foreign-born and one native-born (Table XIV). The number of homes where both of

TABLE XIV

PARENTAGE—NUMBER OF FAMILIES

	Both Parents Foreign Born	One Parent Foreign Born	Both Parents Native Born
Centralia	4	2	31
Champaign	7	17	125
Gibson City	10	8	49
Rochelle	8	8	49
Total	29	35	254

the parents were foreign born is too small to furnish any reliable coefficients of relationship.

Only a few of the foreign-born parents have had more than a common-school training, while the children have done a little better. It must be

TABLE XV

CORRELATION OF SCHOOLING OF FOREIGN-BORN PARENTS AND SCHOOLING OF THEIR SONS

Years of Schooling of Sons	Average Years of Schooling of Parents					
	5	6	7	8	9	10
15	.....	1	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	2	.....	4
11	.....	.....	1	2	.....	.....
10	.....	.....	1	3	.....	1
9	.....	.....	2	1	.....	.....
8	5	.....	4	5	.....	.....
7	.....	.....	.....	3	.....	.....
6	.....	.....	.....	1	.....	.....

remembered in reading Tables XV and XVI that parents are duplicated where more than one older child no longer in school was in the family. Hence, although five boys and six girls came from homes where the average schooling of the parents was ten years, they came from four

families, while two homes furnished the nine children who came from homes where the average schooling of the parents was five years.

TABLE XVI

CORRELATION OF SCHOOLING OF FOREIGN-BORN PARENTS AND SCHOOLING OF THEIR DAUGHTERS

Years of Schooling of Daughters	Average Years of Schooling of Parents					
	5	6	7	8	9	10
15	1					
14		1				
13						
12		2	1	3		2
11						
10						1
9			1	1	1	
8	3		3	5	2	3
7			2	4		
6						

c) Schooling of farm parents.[1]—Two hundred and ninety-nine of the children reported the occupations of their fathers (Table XVII). Of this total, 76, or about 25 per cent, were engaged in farming. This

TABLE XVII

RATIO OF RURAL TO OTHER OCCUPATIONS

	Farmers	Other Occupations
Centralia	4	33
Champaign	17	116
Gibson City	26	38
Rochelle	29	36
Total	76	223

number provided a group large enough to be fairly representative. In this group 84 sons and 61 daughters were reported as being no longer in school. The relationships between the schooling of these children and

[1] Some of these parents may reside in town, though they consider themselves farmers.

the average schooling of their parents are 0.35±0.06 for the boys (Table XVIII) and 0.47±0.07 for the girls (Table XIX).

TABLE XVIII

CORRELATION BETWEEN EDUCATION OF FARM PARENTS AND EDUCATION OF THEIR SONS

Years of Schooling of Sons	Average Years of Schooling of Parents									
	4	5	6	7	8	9	10	11	12	13
16					1	1				
15						2			1	
14									1	
13							1			
12				2	2	2	2	1	1	1
11					1	2			1	
10				1	7	4	4			
9			1	3	6	1	2			
8	1	5		2	15	2	1			
7				1	4	2				

$r = 0.35 \pm 0.06$

$n = 84$

Median education of sons, 9 years

TABLE XIX

CORRELATION BETWEEN EDUCATION OF FARM PARENTS AND EDUCATION OF THEIR DAUGHTERS

Years of Schooling of Daughters	Average Years of Schooling of Parents								
	4	5	6	7	8	9	10	11	12
15					1				1
14					1		1	1	
13					2	1	1	1	
12					7	2			
11					2	1			
10				3	2	1	1		
9				3	1	1			
8	1	2		3	12	3	1		
7				2	3				

$r = 0.47 \pm 0.07$

$n = 61$

Median education of daughters, 9 years

d) *Schooling of town parents.*—The fathers who were engaged in occupations other than farming had 232 sons and 229 daughters no longer in school (Tables XX, XXI). The correlations between the

TABLE XX

CORRELATION BETWEEN EDUCATION OF TOWN PARENTS AND EDUCATION OF THEIR SONS

Years of Schooling of Sons	Average Years of Schooling of Parents												
	4	5	6	7	8	9	10	11	12	13	14	15	16
20	....	....	....	....	....	....	....	....	....	....	1	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	....	....	1	2	1	....	....	....	....	....	1	....
17	....	....	....	....	....	....	....	1	....	....	....	....	....
16	....	....	....	....	1	2	2	2	1	3	....	1	....
15	....	....	1	1	4	1	....	....	....	1	....	....	1
14	....	....	....	....	4	1	1	3	3	....	....	....	....
13	....	....	....	....	1	1	....	1	2	....	....	....	1
12	....	1	1	3	16	5	8	1	6	4	5	1	1
11	....	2	2	4	9	2	3	2	3	1	....	....	....
10	....	....	2	3	12	3	4	4	....	....	....	1	....
9	1	....	....	4	7	....	2	3	....	....	1	....	....
8	....	2	2	8	23	....	....	5	2	2	....	....	....
7	....	3	2	2	4	....	....	1	....	1	....	....	....
6	....	....	....	....	1	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	1	....	....	....	....	....	....	....	....

$r = 0.30 \pm 0.04$

$n = 232$

Median education of sons, 11 years

schooling of these children and the average schooling of their parents are 0.30 ± 0.04 for the sons and 0.35 ± 0.04 for the daughters.

e) *Sex relationships.*—No important sex differences were found. The correlation between fathers and sons in the matter of years of schooling received is practically identical with that between the mothers and daughters. The former is 0.44 ± 0.03 (Table XXII); the latter, 0.43 ± 0.03 (Table XXIII).[1]

[1] Some of the children reported the schooling of but one parent. Hence the total figures given in Tables XXII and XXIII are slightly larger than those in Tables XII and XIII.

TABLE XXI

CORRELATION BETWEEN EDUCATION OF TOWN PARENTS AND EDUCATION OF THEIR DAUGHTERS

Years of Schooling of Daughters	Average Years of Schooling of Parents											
	5	6	7	8	9	10	11	12	13	14	15	16
19	....	....	....	....	....	....	....	....	....	....	1	....
18	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	1	1	....	1	....	....	....
16	....	....	1	1	1	2	2	2	4	2	2	1
15	1	....	....	1	1	....	2	....	....	1	....	....
14	....	2	....	....	3	3	1	5	1	....	....	2
13	....	2	....	1	4	1	4	4	1	1	....	....
12	1	3	4	17	8	7	5	4	2	6	3	....
11	....	1	1	8	1	1	2	1	2	....	....	....
10	....	4	2	9	2	1	3	1	1	1	....	4
9	....	....	2	8	2	1	....	....	....	....	....	....
8	1	....	8	23	2	4	1	1	1	....	....	....
7	1	1	1	2	1	....	....	....	....	....	....	....
6	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....
4	1	....	....	....	....	....	....	....	....	....	....	....

$r = 0.35 \pm 0.04$
$n = 229$
Median education of daughters, 12 years

TABLE XXII

CORRELATION BETWEEN EDUCATION OF FATHERS AND EDUCATION OF THEIR SONS

Years of Schooling of Sons	Years of Schooling of Fathers																
	0	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	4	...	...	...	...	...	...	1	...	...	1
17	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
16	...	...	...	...	...	...	4	1	2	...	5	...	2	...	1	...	...
15	...	...	...	...	1	...	5	1	...	1	1	...	1	...	1	...	...
14	...	...	...	...	...	...	6	1	...	3	2	...	...	...	...	...	...
13	...	...	...	...	...	...	2	...	...	2	1	...	...	...	1	...	...
12	...	...	...	...	2	3	28	2	2	2	16	...	2	2	5	...	1
11	...	...	1	2	1	4	12	2	1	2	6	...	1	1	...	...	...
10	...	...	1	...	3	1	24	2	5	...	4	...	1	...	...	...	...
9	1	...	...	1	1	3	18	1	3	1	1	...	...	...	1	...	...
8	...	1	...	5	6	5	48	2	...	...	7	...	...	...	1	...	...
7	...	...	2	1	2	3	6	2	...	...	2	...	...	...	...	...	...
6	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...

$r = 0.44 \pm 0.03$
$n = 317$

f) Rent.—It may be rather unfair to combine the figures for the four towns, because rental values vary from town to town for approximately the same accommodations. Such variations tend to reduce the figures

TABLE XXIII

CORRELATION BETWEEN EDUCATION OF MOTHERS AND EDUCATION OF THEIR DAUGHTERS

Years of Schooling of Daughters	Years of Schooling of Mothers												
	4	5	6	7	8	9	10	11	12	13	14	15	16
19	....	....	....	....	....	....	....	....	....	1	....	....	....
18	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	1	....	....	1	1	....	....	....	....
16	....	....	....	....	3	....	....	6	6	....	1	....	3
15	....	....	....	....	3	1	....	....	1	....	2	....	....
14	....	....	2	1	4	1	2	....	8	2	1	....	2
13	....	....	1	....	6	1	2	2	9	2	....	1	....
12	1	....	2	3	27	3	12	4	12	3	1	1	3
11	....	....	....	1	13	1	1	2	3	....	1	....	....
10	....	1	1	3	16	2	2	2	5	....	1	....	1
9	....	....	2	1	13	....	3	....	....	....	....	....	....
8	....	4	2	5	44	....	4	2	2	....	1	....	....
7	....	....	3	1	6	....	1	....	....	....	....	....	....
6	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	1	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.43 \pm 0.03$
$n = 300$

of relationship obtained, though perhaps not as much as might be expected. There is probably a positive correlation between rental values and the opportunities for education offered by a community. If such be the case, it must counteract the effects of the variations.

TABLE XXIV

OWNERS AND RENTERS

	Owners	Renters
Centralia	25	3
Champaign	85	21
Gibson City	45	10
Rochelle	17	7
Total	172	41

Only 241 out of the 213 families which gave the information pay rent (Table XXIV). Since the pupils were requested to estimate the rental values of their homes when their parents owned them, most of the rental values are estimates. This fact introduces a certain amount of unreliability into the data which would tend to reduce the correlation figures below their probable values. Even if such be the case, the correlation coefficients are large enough to indicate a clear relationship

TABLE XXV

CORRELATION OF RENTAL VALUES* AND EDUCATION OF SONS

Years of Schooling of Sons	Rent of Home per Month, Dollars													
	10	15	20	25	30	35	40	45	50	55	60	65	70	75
20	....	....	....	....	....	1	....	....	....	....	....	....	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	....	....	....	2	....	....	2	....	....	....	....	....	1
17	....	....	....	....	1	....	....	....	....	....	....	....	....	....
16	1	1	....	2	3	2	3	....	1	....	....	....	....	....
15	1	1	....	....	....	....	1	2	....	....	1	....	....	....
14	1	1	....	4	1	....	....	....	....	2	....	....	2	....
13	1	....	....	....	....	1	....	....	....	1	....	....	....	....
12	2	5	8	9	6	7	9	2	4	....	4	1	....	....
11	....	3	7	5	....	4	1	1	1	....	1	....	....	....
10	3	6	3	4	2	3	....	1	3	....	....	....	3	....
9	7	7	4	3	2	1	1	....	....	....	....	....	....	....
8	8	13	13	11	4	2	2	....	....	....	....	....	....	....
7	2	4	4	1	....	....	....	....	....	....	....	....	....	....
6	....	....	....	....	....	1	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....	....
4	1	....	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.40 \pm 0.04$

$n = 241$

* The rental values were grouped as follows: The $10 group includes all living in homes worth $10 or less per month, the $15 group includes all values between $11 and $15, etc.

(Tables, XXV, XXVI). The correlation between rental values and schooling of sons is 0.40 ± 0.04 and between rental values and schooling of daughters it is 0.24 ± 0.04. These families were a select group from which those children who never reached high school had been eliminated. Where are those families located in rental distribution whose children never went beyond the elementary school? An answer will be suggested by Part IV.

g) Number of books in the home.—The pupils found it more difficult to estimate the number of books in the home than to estimate the rental

TABLE XXVI

CORRELATION OF RENTAL VALUES AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Rent of Home per Month, Dollars																	
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
17	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	1	...	...	2	3	5	1	1	...	...	1	...	1	...	...	...	...	1
15	...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
14	1	3	4	1	...	4	1	1	...	1	...	...	...	...	...	...	...	...	...
13	1	3	1	4	4	1	4	...	1	2	...	...	1	...	...	...	...	...	...
12	7	10	8	9	7	2	6	...	1	...	1	...	...	...	...	...	...	...	...
11	...	4	4	2	...	...	1	...	1	...	1	...	...	1	...	...	...	...	...
10	5	5	8	5	1	1	...	1	2	...	1	...	...	...	...	...	...	...	...
9	1	5	1	2	2	1	1	...	...	...	1	...	...	...	...	...	...	...	...
8	10	11	9	4	4	...	11	4	...	...	2	...	1	...	...	...	...	...	...
7	1	3	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.24 \pm 0.04$

$n = 219$

values of the home. The best showing was made by Champaign, where the data were furnished by the pupils while under the direct supervision of the writer (Table XXVII). Here the pupils were urged to estimate

TABLE XXVII

NUMBER WHO ESTIMATED THE BOOKS IN THE HOME

Centralia	18
Champaign	108
Gibson City	46
Rochelle	42

and were told that a rough estimate was better than none. As an aid in estimating it was suggested that a shelf three feet long held about twenty-five ordinary books. Chance remarks dropped by some of the pupils later disclosed the fact that some who had many books in their homes made rather wild estimates. In every case reported to the writer,

TABLE XXVIII

CORRELATION OF NUMBER OF BOOKS IN THE HOME AND THE SCHOOLING OF SONS

Years of Schooling of Sons	Number of Books in Home											
	10	25	50	75	100	150	200	250	300	400	500	600	700
20	....	....	....	....	....	....	....	....	1	....	....	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	....	....	....	....	....	3	1	....	....	....	....	1
17	....	....	....	....	....	....	....	1	....	....	....	....	....
16	1	....	1	....	2	....	5	....	1	....	2	....	....
15	....	....	1	1	2	2	....	1	....	1	....	....	1
14	....	....	....	....	....	....	....	2	2	1	....	....	1
13	....	....	....	1	1	....	....	....	3	....	....	....	....
12	2	....	5	2	10	7	6	4	6	4	5	....	1
11	2	1	3	....	3	2	2	4	1	1	1	....	....
10	5	....	13	....	6	1	3	2	2	....	1	....	....
9	5	2	6	....	3	2	2	2	1	....	....	....	....
8	7	5	8	2	13	....	3	1	2	2	3	....	1
7	2	1	3	....	3	....	2	....	....	....	....	....	....
6	....	....	....	....	1	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	....	1	....	....	....	....	....	....	....

$r = 0.39 \pm 0.04$

$n = 227$

TABLE XXIX

CORRELATION OF NUMBER OF BOOKS IN HOME AND THE SCHOOLING OF DAUGHTERS

Years of Schooling of Daughters	Number of Books in Home											
	10	25	50	75	100	150	200	250	300	400	500	600	700
17	....	....	1	....	....	....	....	....	....	....	....	....	....
16	....	....	1	....	4	1	3	3	3	....	2	....	2
15	....	....	....	....	....	1	1	1	1	1	....	....	....
14	1	....	2	1	2	1	4	2	....	2	1	....	2
13	....	....	1	....	4	1	1	4	2	1	2	....	....
12	3	3	8	....	9	5	5	2	1	4	5	....	4
11	....	2	1	....	4	1	....	5	....	1	....	....	....
10	1	1	7	1	3	1	5	2	1	....	1	....	....
9	2	2	4	1	2	....	2	....	3	....	....	....	1
8	10	3	6	1	9	1	2	....	4	....	1	....	....
7	1	....	5	....	2	....	....	1	....	....	....	....	....
6	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	1	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.18 \pm 0.04$

$n = 209$

g) *Number of books in the home.*—The pupils found it more difficult to estimate the number of books in the home than to estimate the rental

TABLE XXVI

CORRELATION OF RENTAL VALUES AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Rent of Home per Month, Dollars																		
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
17	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	1	...	...	2	3	5	1	1	...	...	1	...	1	...	...	...	...	1
15	...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
14	1	3	4	1	...	4	1	1	...	1	...	...	...	...	...	...	...	...	...
13	1	3	1	4	4	1	4	...	1	2	...	...	1	...	...	...	...	...	...
12	7	10	8	9	7	2	6	...	1	...	1	...	...	...	...	...	...	...	...
11	...	4	4	2	...	...	1	...	1	...	1	...	...	1	...	...	...	...	...
10	5	5	8	5	1	1	...	1	2	...	1	...	...	...	...	...	...	...	...
9	1	5	1	2	2	1	1	...	...	...	1	...	...	...	...	...	...	...	...
8	10	11	9	4	4	...	11	4	...	...	2	...	1	...	...	...	...	...	...
7	1	3	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.24 \pm 0.04$

$n = 219$

values of the home. The best showing was made by Champaign, where the data were furnished by the pupils while under the direct supervision of the writer (Table XXVII). Here the pupils were urged to estimate

TABLE XXVII

NUMBER WHO ESTIMATED THE BOOKS IN THE HOME

Centralia	18
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and were told that a rough estimate was better than none. As an aid in estimating it was suggested that a shelf three feet long held about twenty-five ordinary books. Chance remarks dropped by some of the pupils later disclosed the fact that some who had many books in their homes made rather wild estimates. In every case reported to the writer,

TABLE XXVIII

CORRELATION OF NUMBER OF BOOKS IN THE HOME AND THE SCHOOLING OF SONS

Years of Schooling of Sons	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	400	500	600	700
20	....	....	....	....	....	....	....	....	1	....	....	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	....	....	....	....	....	3	1	....	....	....	....	1
17	....	....	....	....	....	....	....	1	....	....	....	....	....
16	1	....	1	....	2	....	5	....	1	....	2	....	....
15	....	....	1	1	2	2	....	1	....	1	....	....	1
14	....	....	....	....	....	....	....	2	2	1	....	....	1
13	....	....	....	1	1	....	....	....	3	....	....	....	....
12	2	....	5	2	10	7	6	4	6	4	5	....	1
11	2	1	3	....	3	2	2	4	1	1	1	....	....
10	5	....	13	....	6	1	3	2	2	....	1	....	....
9	5	2	6	....	3	2	2	2	1	....	....	....	....
8	7	5	8	2	13	....	3	1	2	2	3	....	1
7	2	1	3	....	3	....	2	....	....	....	....	....	....
6	....	....	....	....	1	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	....	1	....	....	....	....	....	....	....

$r = 0.39 \pm 0.04$

$n = 227$

TABLE XXIX

CORRELATION OF NUMBER OF BOOKS IN HOME AND THE SCHOOLING OF DAUGHTERS

Years of Schooling of Daughters	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	400	500	600	700
17	....	....	1	....	....	....	....	....	....	....	....	....	....
16	....	....	1	....	4	1	3	3	3	....	2	....	2
15	....	....	....	....	....	1	1	1	1	1	....	....	....
14	1	....	2	1	2	1	4	2	....	2	1	....	2
13	....	....	1	....	4	1	1	4	2	1	2	....	....
12	3	3	8	....	9	5	5	2	1	4	5	....	4
11	....	2	1	....	4	1	....	5	....	1	....	....	....
10	1	1	7	1	3	1	5	2	1	....	1	....	....
9	2	2	4	1	2	....	2	....	3	....	....	....	1
8	10	3	6	1	9	1	2	....	4	....	1	....	....
7	1	....	5	....	2	....	....	1	....	....	....	....	....
6	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....
4	1	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.18 \pm 0.04$

$n = 209$

the compulsory education law operates until this age is reached, and those under fourteen have not legally completed their education. The local public-school system was used as a standard for comparison and all estimates were made by comparisons with it. An appreciable number of these people were educated in other schools—some in schools of other states. This fact introduces a small degree of unreliability. The writer feels, however, that, if the true amounts of schooling of these individuals could be ascertained, they would not vary from the amounts given here by more than a year or two, except in possibly five or ten

TABLE XXXI

	Birthplace Of	
	Fathers	Mothers
United States	211	226
Germany	9	6
England	4	1
Canada	44	.....
Ireland	3	.....
Sweden	2	.....
Scotland	1	1
Total foreign-born	33	8

TABLE XXXII

	Language Commonly Spoken by Parents Of	
	Fathers	Mothers
English	219	223
German	12	10
Scotch	1	1
Swedish	1	.....
Norwegian	1	.....

cases where it was impossible to do more than estimate roughly the education of the individuals concerned. Such cases were those of dead parents and families where the father had deserted the home. In nearly all cases where there was any doubt, the amount listed is probably an overestimation instead of an underestimation. It was more difficult to estimate the education of those who had never gone beyond the elementary school.

The educational level of a home, however, is probably a rather constant factor, changing but little after the parents have started to rear their children.

RELATIONSHIPS BETWEEN PARENTS AS TO NUMBER OF YEARS OF SCHOOLING

Fathers and mothers are much alike with reference to the number of years of schooling they have received. Mothers as a group are slightly less variable in the matter of education than fathers (Fig. 1). The mode and the median fall at eight years for both mothers and fathers. The

last two years of the elementary school is where a large number of parents finished their schooling, probably because many of them were reared in the country, and rural schools did not extend beyond the eighth grade. Since the high school constitutes another division of the school, we again

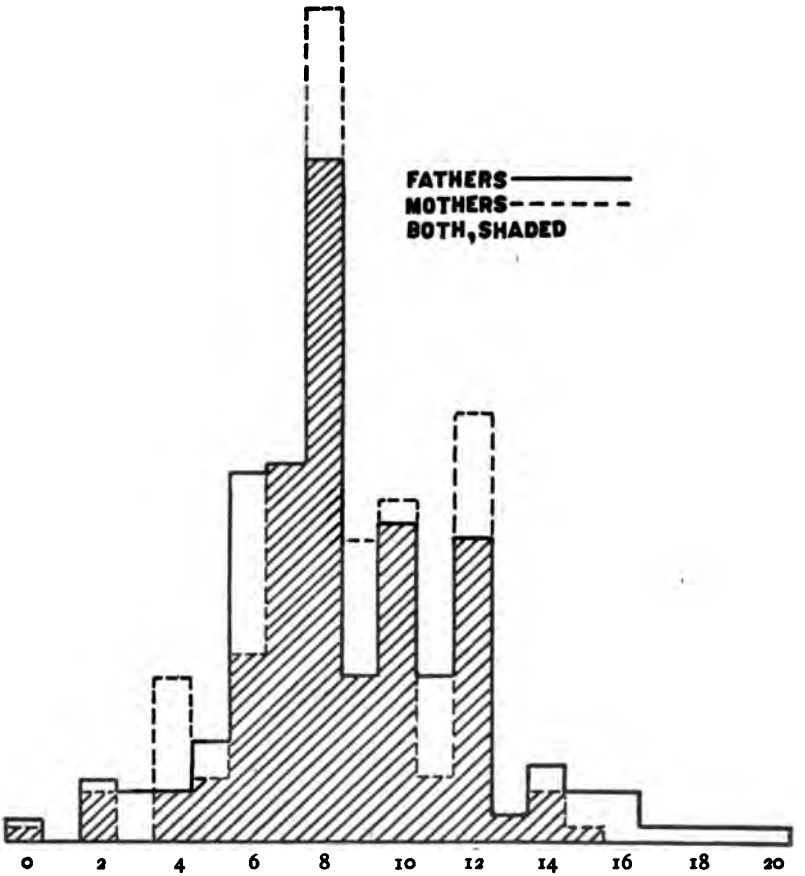

FIG. 1.—Education of Urbana Fathers and Mothers: Years of Schooling

find, what common-sense has already taught us, that the end of the high school was also a stopping-place for a large number. Only a small number of people went to a college or university. This is somewhat surprising, until an explanation is sought, for Urbana has been the seat of

the state university since its foundation in 1869. When it is remembered that university work until quite recently did little except prepare for the professions, this scarcity of college people seems more natural. Further,

TABLE XXXIII

CORRELATION BETWEEN EDUCATION OF FATHERS AND EDUCATION OF MOTHERS

Years of Schooling of Fathers	Years of Schooling of Mothers															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
20	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
17	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...
15	...	...	...	...	...	...	...	...	1	1	1	...	1	...	...	...
14	...	...	...	...	...	...	...	...	1	...	1	...	3	...	...	1
13	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
12	...	...	...	...	1	...	...	1	1	5	...	1	12	...	3	...
11	...	...	...	...	...	...	...	...	6	3	2	...	1	1	...	...
10	...	...	...	...	...	...	...	1	7	...	10	2	5	...	...	...
9	...	...	...	...	1	...	...	1	3	4	1	...	3	...	...	...
8	...	...	1	...	...	...	1	1	32	5	9	2	3	...	...	...
7	...	...	...	...	2	...	3	15	8	...	1	...	1	...	...	...
6	...	...	...	...	4	3	9	7	2	2	2	...	...	...	...	...
5	...	...	...	...	1	2	2	2	1	...	...	...	...	...	...	...
4	...	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...
3	1	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...
2	...	...	1	...	1	...	...	1	1	1	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...

$r = 0.65 \pm 0.03$

$n = 231$

Median education of fathers and mothers, both 8 years

many of these professional people have been eliminated through the rejection of data from the university residence district. The correlation[1] between the schooling of the father and the schooling of the mother is high, being 0.65 ± 0.03 (Table XXXIII).

[1] It might be well to explain, at this point, what is meant by a coefficient of correlation. Coefficients of correlation are measures of resemblance between quantities found coexisting under varying conditions. There may be complete correspondence, +1.00 (the + sign is omitted in this study), or the exact opposite, −1.00. Usually, however, the measures secured contain chance errors and a correlation of 1.00, positive (or negative), is almost never obtained. A coefficient of 0.60 or more, in this study, indicates a high degree of correspondence and becomes quite significant.

RELATIONSHIPS BETWEEN PARENTS AND CHILDREN

1. *Fathers and sons.*—The curve (Fig. 3) of this relationship looks as if some factor such as the compulsory education law had modified its general character. At any rate, the coefficient of correlation is low, being 0.47 ± 0.03 (Table XXXIV).

FIG. 2.—Correlation between Education of Fathers and Mothers

2. *Mothers and daughters.*—This relationship is much higher than that between fathers and sons and the curve (Fig. 4) lacks the flattened appearance at the lower end which characterizes the other. This may be due to the tendency of girls to stay in school longer than boys, or it may be a mere chance variation. The coefficient of correlation is $0.60 \pm$

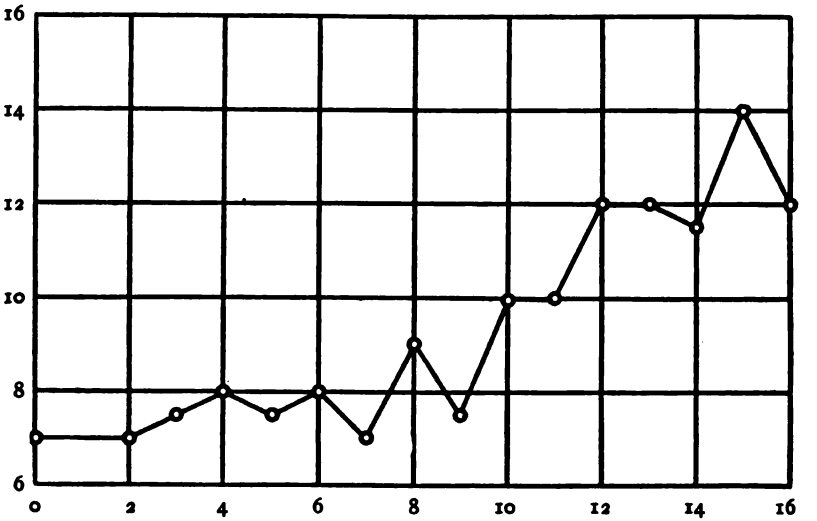

FIG. 3.—Correlation between Education of Fathers and Sons

TABLE XXXIV

CORRELATION BETWEEN EDUCATION OF FATHERS AND EDUCATION OF SONS

Years of Schooling of Sons	Years of Schooling of Fathers																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
18	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...
17	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	1	...	2	...	...	...	1	1	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	2	...	...	...	1	1	...	1	...	...	...	...	...
13	...	...	...	...	...	...	...	...	2	...	1	2	1	...	2	...	...	...	...	...	...
12	...	...	1	...	...	...	...	4	5	...	3	1	5	...	...	1	1	...	...	...	...
11	...	...	...	1	1	...	1	...	5	...	1	2	2	...	...	...	1	...	...	...	...
10	...	...	...	...	...	2	...	3	4	...	...	1	3	1	1	...	...	...	...	...	...
9	...	...	1	...	...	2	4	5	4	1	1	...	...	...	1	...	...	...	...	...	1
8	...	...	2	2	2	2	14	4	10	3	5	2	1	...	1	...	...	...	...	...	...
7	5	...	2	1	...	2	6	14	7	1	1	1	3	...	...	...	...	...	...	...	...
6	...	...	2	...	...	...	6	3	2	1	1	1	1	...	...	...	...	...	...	...	...
5	2	...	...	2	...	1	4	...	1	1	...	1	...	...	...	...	...	...	...	...	...
4	...	...	1	...	1	3	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
3	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.47 \pm 0.03$

$n = 224$

Median education of sons, 8 years

0.03 (Table XXXV). The daughter who is indicated as illiterate was an epileptic, unable to attend school.

TABLE XXXV

CORRELATION BETWEEN EDUCATION OF MOTHERS AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Years of Schooling of Mothers											
	2	3	4	5	6	7	8	9	10	11	12	13
19	....	....	....	....	....	....	....	....	....	....	1	....
18	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	1	....	4	....	3	....	11	....
15	....	....	....	....	....	....	2	....	....	....	2	....
14	....	....	....	....	....	....	....	1	....	1	2	....
13	....	....	....	....	....	....	1	1	4	2	....	....
12	1	....	....	....	....	4	11	2	11	3	7	1
11	....	....	2	....	....	2	5	2	1	....	2	....
10	....	....	1	....	5	3	11	1	1	....	3	....
9	....	....	....	....	....	4	4	3	....	....	2	....
8	....	....	3	1	8	6	17	4	5	....	2	....
7	....	....	3	1	9	6	10	1	2	....	....	....
6	3	....	2	2	2	3	3	....	....	....	....	....
5	2	....	2	3	....	3	....	....	....	....	....	....
4	....	....	....	....	....	....	....	....	....	....	....	....
3	....	....	....	....	1	....	1	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....
0	....	....	....	....	1	....	....	....	....	....	....	....

$r = 0.60 \pm 0.03$

$n = 234$

Median education of daughters, 9 years

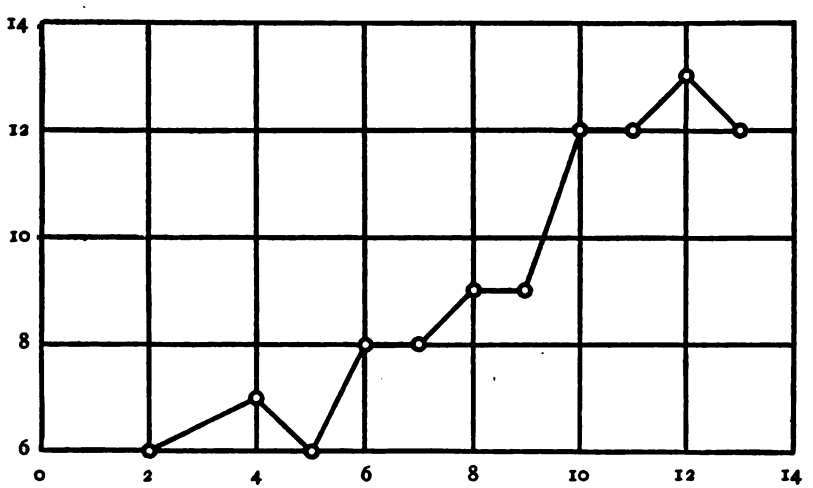

FIG. 4.—Correlation between Education of Mothers and Daughters

3. *Fathers and daughters.*—This relationship is higher than that between fathers and sons and lower than that between mothers and daughters. The difference is so little in either case that it cannot legitimately be made the basis of any conclusion. The coefficient of correlation is 0.56±0.03 (Table XXXVI).

TABLE XXXVI

CORRELATION BETWEEN EDUCATION OF DAUGHTERS AND EDUCATION OF FATHERS

Years of Schooling of Daughters	Years of Schooling of Fathers																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
19	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	1	4	1	1	1	2	2	4	2	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	1	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2	...	...	...	...	...	...
13	...	...	1	...	...	...	...	...	1	...	3	1	1	...	...	...	1	...	...	...	...
12	...	...	1	...	...	...	2	3	12	2	4	5	8	...	1	...	...	1	...	...	...
11	...	...	2	...	...	1	1	2	3	2	2	1	1	...	...	...	...	...	...	...	...
10	...	...	...	...	...	1	4	4	8	1	2	...	2	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	2	3	2	2	...	...	1	1	...	...	...	...	...	...	1
8	...	...	3	2	3	1	11	12	8	1	5	1	...	...	...	...	...	...	...	...	...
7	...	...	...	1	2	2	10	10	6	...	1	...	...	...	...	...	...	...	...	...	...
6	3	...	3	...	1	...	4	3	...	...	2	...	...	...	...	...	...	...	...	...	...
5	...	...	1	...	...	1	3	...	...	...	...	...	1	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.56 \pm 0.03$

$n = 231$

4. *Mothers and sons.*—This relationship is almost the same as the preceding, the coefficient of correlation being 0.55±0.03 (Table XXXVII).

5. *Parental average and children.*—When the average schooling of each family is correlated with the schooling of the children, a closer relationship is revealed. The coefficients of correlation are 0.65±0.03 for the sons (Table XXXVIII) and 0.62±0.03 for the daughters (Table XXXIX), a rather high degree of correspondence.

TABLE XXXVII

CORRELATION BETWEEN EDUCATION OF SONS AND EDUCATION OF MOTHERS

Years of Schooling of Sons	Years of Schooling of Mothers															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
17	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...
16	...	...	...	...	...	...	1	...	3	...	...	...	2	...	...	...
15	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	...
14	...	...	...	...	...	...	...	...	3	...	...	...	2	...	...	...
13	...	...	...	...	...	...	...	...	2	1	1	1	2	...	...	1
12	...	...	...	...	1	...	...	1	4	2	5	1	5	...	1	...
11	...	...	...	...	...	...	1	1	4	1	2	...	4	...	...	...
10	...	...	...	...	...	1	...	2	5	...	2	...	2	...	...	...
9	...	...	...	...	2	...	1	5	5	4	2	...	1	...	...	...
8	...	...	1	...	3	...	3	11	18	5	2	...	4	...	...	...
7	...	...	...	...	6	1	5	9	10	4	...	...	...	...	...	...
6	...	...	4	...	4	1	4	3	3	...	1	...	...	...	...	...
5	1	...	...	...	3	1	3	2	1	1	...	...	...	...	...	...
4	...	...	1	...	5	...	...	1	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...

$r = 0.55 \pm 0.03$

$n = 214$

TABLE XXXVIII

CORRELATION BETWEEN EDUCATION OF SONS AND AVERAGE EDUCATION OF PARENTS

Years of Schooling of Sons	Average Years of Schooling of Parents													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
18	....	....	....	....	....	....	....	....	....	....	....	....	1	1
17	....	....	....	....	....	....	....	....	1	....	....	....	1	....
16	....	....	....	....	....	1	....	1	2	....	....	....	2	....
15	....	....	....	....	....	....	....	....	....	2	....	....	1	....
14	....	....	....	....	....	....	....	2	....	....	1	2	1	....
13	....	....	....	....	....	....	....	2	1	2	....	1	1	1
12	....	....	....	....	2	....	2	2	4	5	1	3	1	1
11	....	....	....	....	1	1	....	3	3	2	....	2	....	1
10	....	....	....	....	1	2	3	3	2	1	....	3	....	....
9	....	....	1	....	2	2	7	3	2	1	....	1	....	1
8	....	....	1	1	4	13	8	13	1	2	2	2	1	....
7	....	....	1	4	4	6	13	6	1	2	....	....	....	....
6	4	1	....	1	2	4	3	2	1	1	....	....	....	....
5	1	2	....	1	1	5	1	....	1	....	....	....	....	....
4	....	1	....	4	....	1	....	....	....	....	....	....	....	....
3	....	....	....	2	....	....	....	....	....	....	....	....	....	....

$r = 0.65 \pm 0.03$

$n = 220$

6. *Sons and better-educated parent.*—When the relationship which existed between the better-educated parent of each family and the sons in the matter of schooling was evaluated, it furnished a correlation coefficient of 0.60±0.03 (Table XL).

TABLE XXXIX

CORRELATION BETWEEN EDUCATION OF DAUGHTERS AND AVERAGE EDUCATION OF PARENTS

Years of Schooling of Daughters	Average Years of Schooling of Parents													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19	....	....	....	....	....	....	....	....	....	....	....	1	....	....
18	....	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	....	1	....	3	2	2	....	5	5	1
15	....	....	....	....	....	....	....	....	2	....	....	....	1	....
14	....	....	....	....	....	....	....	....	....	2	....	....	2	....
13	....	....	....	....	1	....	....	....	2	3	....	1	....	1
12	....	....	....	....	2	2	3	4	11	7	....	10	....	....
11	....	....	1	....	2	1	2	3	2	3	....	1	....	....
10	....	....	....	....	1	4	4	8	4	....	....	1	....	....
9	....	....	....	....	....	....	5	4	1	1	....	1	....	1
8	....	....	2	1	3	14	11	9	3	2	2	....	....	....
7	....	....	....	2	2	12	8	7	1	....	....	....	....	....
6	3	....	1	3	2	3	2	1	1	....	....	....	....	....
5	....	2	....	3	4	....	....	1	....	....	....	....	....	....
4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3	....	....	....	....	1	1	....	....	....	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
0	....	....	....	....	....	1	....	....	....	....	....	....	....	....

$r = 0.62 \pm 0.03$

$n = 232$

7. *Sons and more poorly educated parent.* This relationship proved to be nearly the same as the preceding, being slightly lower, 0.57±0.03 (Table XLI).

Comparisons.—All the sons and daughters who have been given in the data thus far presented in this section were reported as having completed their education. A few, perhaps, may reconsider their decisions and continue their schooling later. On the other hand, the parents passed the customary ages for school attendance long ago. Hence, when the amounts of schooling which the children have received are compared

TABLE XL

CORRELATION BETWEEN EDUCATION OF SONS AND EDUCATION OF BETTER-EDUCATED PARENT

Years of Schooling of Sons	Years of Schooling of Better-Educated Parent																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
18	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...
17	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
16	...	...	...	...	...	1	1	...	2	...	...	...	1	1	...	...	...	...	...
15	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...
14	...	...	...	...	...	...	2	...	...	...	1	1	...	1	...	...	...	...	...
13	...	...	...	...	...	...	1	1	...	3	1	...	1	1	...	...	...	...	...
12	...	...	...	...	...	2	3	...	4	3	5	...	1	1	1	...	...	...	...
11	...	...	...	...	1	1	2	1	2	2	3	...	...	...	1	...	...	...	...
10	...	...	...	1	...	2	4	...	1	1	2	1	1	...	...	...	...	...	...
9	...	...	1	...	2	4	6	3	1	...	1	...	1	...	...	...	...	...	1
8	...	...	2	...	5	10	14	8	3	1	3	1	1	...	...	...	...	...	...
7	...	...	...	2	6	10	10	3	1	...	3	...	...	...	...	...	...	...	...
6	4	...	2	...	5	3	3	...	1	1	1	...	...	...	...	...	...	...	...
5	...	1	2	1	3	1	1	2	...	1	...	...	...	...	...	...	...	...	...
4	1	...	1	3	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.60 \pm 0.03$
$n = 216$

TABLE XLI

CORRELATION BETWEEN EDUCATION OF SONS AND EDUCATION OF MORE POORLY EDUCATED PARENT

Years of Schooling of Sons	Years of Schooling of More Poorly Educated Parent														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
18	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...
17	...	...	...	...	...	...	...	...	1	...	...	...	11	...	...
16	...	...	...	...	...	...	...	...	3	...	...	...	2	...	...
15	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...
14	...	...	...	...	...	...	...	...	3	...	...	...	2	...	...
13	...	...	...	...	...	...	...	...	3	...	2	...	2	...	1
12	...	...	1	...	1	...	...	2	6	2	3	...	5	...	...
11	...	...	...	1	...	...	1	...	7	...	1	...	3	...	...
10	...	...	...	...	1	2	...	1	6	...	1	...	2	...	...
9	...	...	1	...	1	2	3	6	3	2	2	...	...	...	...
8	...	...	3	2	3	2	12	6	13	...	4	1	2	...	...
7	...	...	2	1	6	1	6	11	6	2	...	...	...	...	...
6	5	...	2	...	2	1	5	2	2	...	1	...	...	...	...
5	3	...	...	1	2	1	3	1	1	...	...	...	...	...	...
4	...	...	1	...	5	...	...	1	...	...	...	...	...	...	...
3	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.57 \pm 0.03$
$n = 216$

with the amounts received by their parents a generation earlier, an incomplete quantity is being compared with a complete one.

1. Amounts of education received by fathers and sons: The fathers have received almost as much schooling as their sons. The difference

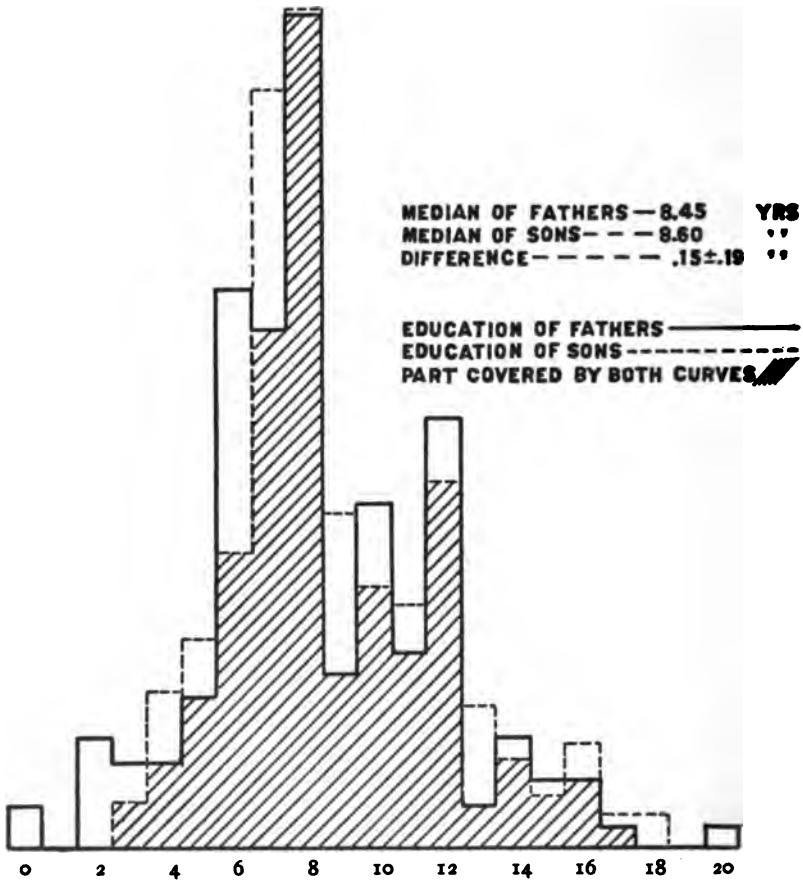

FIG. 5.—Education of Fathers and Sons: Years of Schooling

between the medians, 8.45 years for the fathers and 8.60 years for the sons, is only 0.15±0.19 year (Fig. 5). When these comparative surfaces of frequency are examined, it is seen that a few more fathers are at the lower end and a few more sons at the upper end. When the character of the school work completed by both groups is taken into consid-

eration, it must be admitted that the present generation, although apparently attending school for no more years than its predecessor, has enjoyed a longer school year and a much richer curriculum.

2. Amounts of education received by the mothers and daughters: The mothers have, on the average, received one year less schooling than

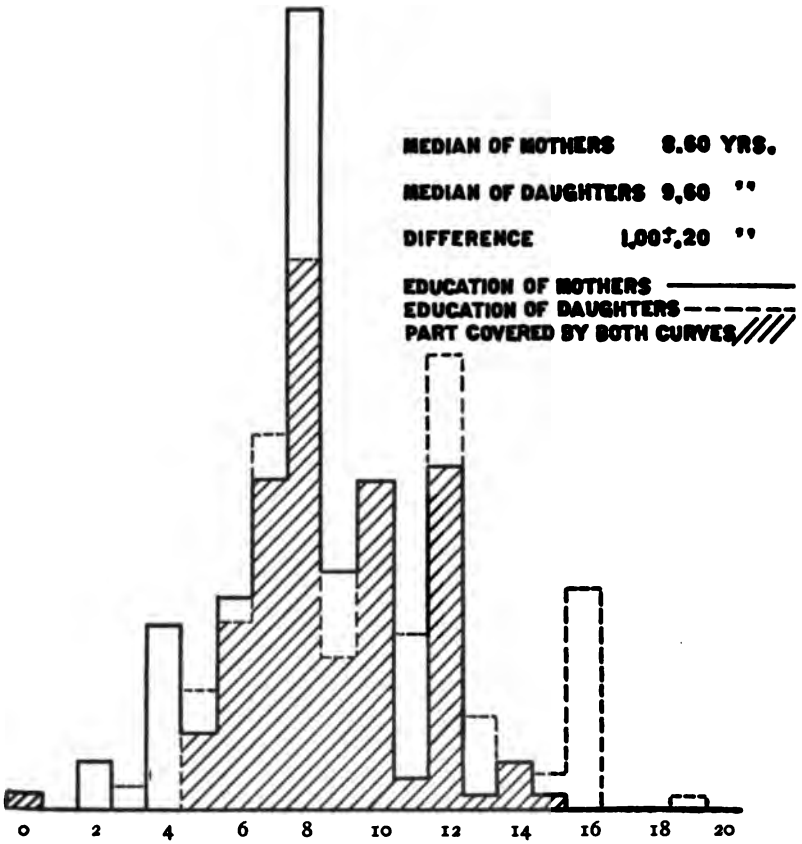

FIG. 6.—Education of Mothers and Daughters: Years of Schooling

their daughters. The median number of years of schooling received is 8.6 years for the mothers and 9.6 years for the daughters. A difference of 1.00±0.20 years (Fig. 6).

These slight differences may be explained partly by the increased educational opportunities offered to the present generation and partly by the desire on the part of parents, especially those poorly educated,

to give their children a little better education than they themselves received. The nature of this difference may, perhaps, be seen best in a comparison of the numbers who received more, the same, or less education than their parents (Tables XLII, XLIII, XLIV). In but few

TABLE XLII

COMPARISON OF EDUCATION OF CHILDREN WITH AVERAGE EDUCATION OF PARENTS

	Average Years of Schooling, Parents													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Sons														
Received more	5	4	3	7	16	25	20	16	13	11	2	3	6	1
Received same	...	...	...	4	1	4	13	13	2	1	...	3	1	...
Received less	...	...	...	2	...	6	4	8	4	6	2	8	2	4
Daughters														
Received more	3	2	4	9	13	34	25	22	23	17	...	7	8	1
Received same	...	...	...	...	4	3	8	9	1	...	...	10	...	...
Received less	...	...	...	...	1	2	2	9	5	3	2	3	...	2

TABLE XLIII

COMPARISON OF EDUCATION OF CHILDREN WITH EDUCATION OF FATHERS

	Years of Schooling of Fathers																			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sons																					
Received more	7	...	11	6	3	8	25	17	24	...	8	3	6	1	1	1	1	...	...	...	...
Received same	...	...	...	...	1	1	6	14	10	1	...	2	5	...	...	...	...	...	...	...	...
Received less	...	...	...	...	...	3	4	4	10	7	8	6	10	1	5	2	2	...	...	...	1
Daughters																					
Received more	3	...	15	3	6	5	30	25	30	6	13	7	5	2	4	2	...	...	...	...	...
Received same	...	...	...	...	...	1	4	10	8	2	2	1	8	...	2	1	1	...	...	...	...
Received less	...	...	...	...	1	1	4	3	6	1	8	1	5	1	1	...	1	1	...	...	1

TABLE XLIV

COMPARISON OF EDUCATION OF CHILDREN WITH EDUCATION OF MOTHERS

	Years of Schooling of Mothers															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sons																
Received more	1	...	6	...	19	3	11	20	27	4	10	2	7	...	3	...
Received same	...	...	...	...	5	1	4	9	18	4	2	...	5	...	...	...
Received less	...	...	...	...	...	...	3	8	14	10	5	...	11	...	1	1
Daughters																
Received more	...	...	6	...	13	4	23	19	38	7	19	4	18	...	...	...
Received same	...	...	...	...	...	3	2	6	17	3	1	...	7	...	...	...
Received less	...	...	...	...	...	...	2	6	14	5	7	...	9	1	...	...

cases did the children of poorly-educated parents receive less education than their parents. When the education of the children of those parents[1] who went to the eighth year or beyond is compared with that of their parents, there is no such marked increase. In comparison with the average education of these parents, 49 per cent of their sons and 64 per cent of their daughters received more education and 32 per cent of their sons and 20 per cent of their daughters received less. In comparison with these fathers 39 per cent of the sons and 59 per cent of the daughters received more, while 45 per cent of the sons and 21 per cent of the daughters received less, showing that these sons actually received less education on the average than their fathers. When the mothers are considered, both the sons and daughters received slightly better average educations, 43 per cent of the sons and 57 per cent of the daughters receiving more than their mothers, and 34 per cent of the sons and 24 per cent of the daughters, less.

Schooling of parents and progress of pupils now in school.—The children fourteen years of age and older who were reported to the writer as intending to continue their schooling were in various grades from the fifth to the last year of the university. An attempt to determine if retardation was greatest among the children of the less educated families was made by comparing each age group with a scale of "ideal progress." According to this scale a boy or girl

14	years	of	age	should	have been in the	8th grade
15	"	"	"	"	"	9th grade
16	"	"	"	"	"	10th grade
17	"	"	"	"	"	11th grade
18	"	"	"	"	"	12th grade
19	"	"	"	"	"	1st year of college
20	"	"	"	"	"	2d year of college
21–22	"	"	"	"	"	3d year of college
23–24	"	"	"	"	"	4th year of college

This scale is entirely arbitrary and is of value only to the extent that it serves as a measure of retardation and acceleration. It assumes, of course, that children enter school at six years of age, which is the general rule in Urbana. This, however, may not have been true of all the cases

[1] This comparison was limited to these parents because their education extended beyond the age affected by compulsory attendance laws. The children of parents who have less education may be kept in school by law more than through parental influence.

recorded in this study. Some may have entered at eight or nine and have progressed through the grades in the normal number of years.

When the resulting comparisons are examined, it is seen that there is a positive relationship between home conditions and the progress of the pupils. With the girls this is only 0.22 ± 0.06 (Table XLVI), while

TABLE XLV

CORRELATION BETWEEN AVERAGE EDUCATION OF PARENTS AND PROGRESS OF SONS YET IN SCHOOL

RELATION TO PROGRESS, BOYS

Years	Average Years of Schooling of Parents									
	5	6	7	8	9	10	11	12	13	14
+2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
+1	.....	.....	.....	.....	2	2	.....	.....	.....	.....
0	2	.....	.....	4	4	7	4	2	2	.....
−1	.....	4	3	7	5	3	1	2	2	.....
−2	1	2	2	5	1	2	.....	.....	1	.....
−3	.....	2	1	3	.....	.....	.....	.....	.....	.....
−4	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
−5	.....	.....	.....	.....	.....	1	.....	.....	.....	.....

$r = 0.37 \pm 0.07$
$n = 79$
Average retardation, 0.96 year

TABLE XLVI

CORRELATION BETWEEN AVERAGE EDUCATION OF PARENTS AND PROGRESS OF DAUGHTERS YET IN SCHOOL

RELATION TO PROGRESS, GIRLS

Years	Average Years of Schooling of Parents											
	5	6	7	8	9	10	11	12	13	14	15	16
+1	1	.....	.....	2	3	4	1	2	.....	1	.....	.....
0	4	2	2	5	4	6	4	5	2	1	1	1
−1	2	2	7	5	1	7	2	.....	.....	.....	.....	.....
−2	.....	1	1	5	2	2	.....	.....	.....	.....	.....	.....
−3	1	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
−4	.....	.....	2	.....	.....	.....	.....	1	.....	.....	.....	.....

$r = 0.22 \pm 0.06$
$n = 97$
Average retardation, 0.63 year

it is 0.37±0.07 with the boys. The boys, with an average of 0.96 year retardation, were retarded more than the girls, who averaged 0.63 year.

SUMMARY AND CONCLUSIONS

The relationships presented in this section may be summed up as in Table XLVII.

TABLE XLVII

Education of fathers correlated with education of mothers	0.65±0.03
" " fathers " " " " sons	0.47±0.03
" " mothers " " " " daughters	0.60±0.03
" " fathers " " " " daughters	0.56±0.03
" " mothers " " " " sons	0.55±0.03
" " parents " " " " sons	0.65±0.03
" " parents " " " " daughters	0.62±0.03
" " better-educated parent correlated with education of sons	0.60±0.03
" " more poorly educated parent correlated with education of sons	0.57±0.03
" " parents correlated with progress of sons	0.37±0.07
" " parents " " " " daughters	0.22±0.06

Fathers are slightly more variable with respect to number of years of schooling received than are the mothers.

The median amounts of schooling of parents and children are as follows:

Fathers, 8.45 years	Mothers, 8.60 years
Sons, 8.60 years	Daughters, 9.60 years
Difference, 0.15±0.19 years	Difference, 1.00±0.20 years

The boys now in school are retarded more than the girls, as indicated by an age-grade distribution.

There is a close relationship between the educational level of a home and the length of time children remain in school.

SECTION II. ECONOMIC HOME CONDITIONS

This section deals with the economic status of the families under consideration. The economic status of a family is not always apparent to a visitor. Nor can one receive a wholly reliable estimate of it from an examination of the assessor's sheets. Since this study includes families all of whose children are grown, other families with infants

taxing their resources, and all sorts of intermediate types, it is quite apparent that an index which adequately represents the economic status of each family is not easily obtainable. Three indices—rental value of home, personal property assessment, and real estate assessment—were selected as criteria, and the results bearing upon them are presented for what they are worth.

RENTAL VALUES AND SCHOOLING OF CHILDREN

Every home was assigned a rental value at the time the data were collected. This was a comparatively easy matter, for in most cases where the home was owned by the family the member who furnished the information to the writer was fairly well acquainted with rental values in the neighborhood. A little difficulty was experienced in determining rental indices for a few of the better homes which were built by their present occupants for their own use and which far surpassed all rented homes in the neighborhood in beauty and conveniences. In such cases the writer usually offered a conservative figure to some responsible member of the family for approval. Hence, nearly all the homes with rental indices of $40 a month or more are probably underestimated. Since rental values are subject to fluctuation, the approximations given here cannot be considered as valid or representative for any considerable period of time. A further complication was due to the presence of roomers in a few homes. This tended to reduce the real rents below the values assigned to these homes. Such families were included in the group given here, although such a procedure may be open to criticism. In spite of all the disturbing influences mentioned, it is felt by the writer that the rental index is a fairly good measure of the economic status of families.

When the rental values were correlated with the amounts of schooling which the children have received, the coefficients of correlation, 0.63 ± 0.03 for the sons (Table XLVIII) and 0.64 ± 0.03 for the daughters (Table XLIX), were obtained. If the large number of disturbing factors which have affected the indices are taken into consideration, these correlations seem high.

PERSONAL PROPERTY ASSESSMENTS AND SCHOOLING OF CHILDREN

The personal property indices were taken from the 1915 tax books at the courthouse in Urbana. These assessments were made during the

TABLE XLVIII

CORRELATION BETWEEN RENTAL VALUES AND EDUCATION OF SONS

Years of Schooling of Sons	Rental Values of Home, Dollars per Month														
	10	12.50	15	17.50	20	22.50	25	27.50	30	35	40	45	50	55	60
18	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....
17	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....
16	....	....	....	....	....	....	....	....	1	5	....	....	....	....	....
15	....	....	2	....	1	....	....	....	....	....	....	....	....	....	....
14	....	....	....	....	1	....	1	....	2	1	....	....	....	....	....
13	....	....	....	....	....	....	....	....	1	1	1	1	3	....	1
12	....	1	6	1	2	....	....	....	4	....	3	2	2	....	....
11	....	2	3	....	1	....	1	....	2	1	2	....	1	....	....
10	....	....	3	3	3	....	2	1	2	1	....	....	....	....	....
9	1	3	9	....	2	....	....	1	3	1	2	....	....	....	....
8	7	7	16	1	7	3	....	....	2	1	1	....	2	....	....
7	7	9	14	2	3	....	2	....	1	....	....	....	....	....	....
6	1	6	11	....	2	....	1	....	....	....	....	....	....	....	....
5	4	7	1	....	....	....	....	....	....	....	....	....	....	....	....
4	6	....	1	....	....	....	....	....	....	....	....	....	....	....	....
3	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.63 \pm 0.03$

$n = 224$

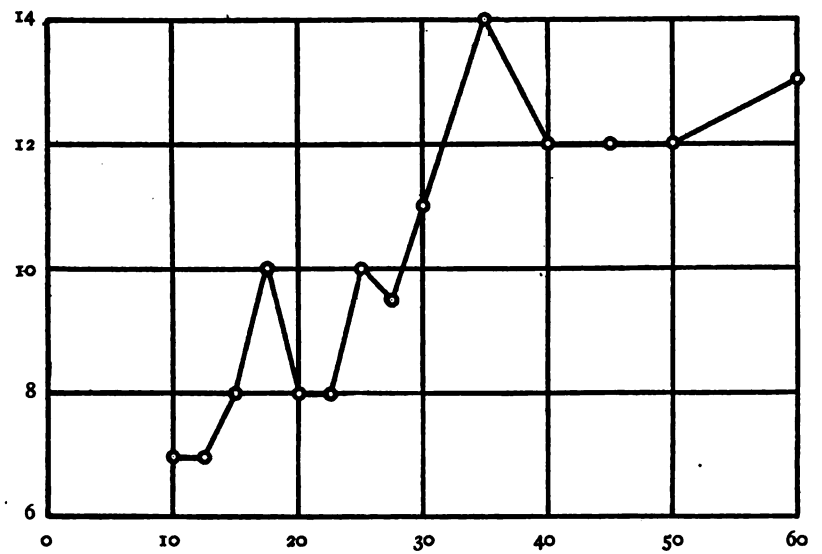

FIG. 7.—Correlation between Education of Sons and Rental Values

summer of 1914 and the figures are supposed to represent one-third of the actual valuation that the properties would have at a forced sale. A few families that were overlooked by the assessor were given the values of the 1913 assessment. A few families that have more personal property than the average were missed by the assessor both times. Owing to the almost universal practice of "tax-dodging," the values given here contain a large element of unreliability. How large this is, cannot be

TABLE XLIX

CORRELATION BETWEEN RENTAL VALUES AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Rental Values of Home, Dollars per Month														
	10	12.50	15	17.50	20	22.50	25	27.50	30	35	40	45	50	55	60
19	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	3	....	2	....	1	6	2	3	....	....	2
15	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....
14	....	....	....	....	....	....	....	....	1	2	....	....	....	....	1
13	1	1	....	....	2	....	1	....	....	....	2	....	1	....	....
12	1	2	10	1	6	....	2	1	9	1	1	4	....	....	1
11	....	....	2	....	3	1	2	....	2	3	1	....	....	....	....
10	2	5	7	1	1	1	1	....	3	1	....	....	....	....	....
9	1	....	3	2	1	1	....	....	4	1	1	....	1	....	....
8	6	6	14	4	5	....	2	....	5	....	2	....	....	....	....
7	9	6	12	2	1	....	....	....	1	....	....	....	....	....	....
6	3	5	7	2	....	....	....	....	....	....	....	....	....	....	....
5	3	3	3	....	1	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
0	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.64 \pm 0.03$

$n = 226$

determined. If it is a constant factor affecting all classes alike, it reduces the indices but does not shift them from their true order. Taking these errors into consideration, it is surprising that the correlations between the schooling of the children and the personal property assessment indices are as large as they are. They are 0.47 ± 0.04 for the sons (Table L) and 0.52 ± 0.04 for the daughters (Table LI). These figures were calculated for the group who were assessed.

TABLE L

CORRELATION BETWEEN PERSONAL PROPERTY VALUES AND EDUCATION OF SONS

Years of Schooling of Sons	Personal Property Assessment of Home, Dollars																			
	0	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	400	500	600
18	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...
17	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	1	...	...	...
15	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...
14	...	...	...	...	...	2	1	2	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	1	...	...	1	...	...	1	1	2	...	...	2
12	4	...	1	...	...	...	3	2	1	2	1	...	2	1	...	1	...	1	...	1
11	...	...	2	2	1	...	...	2	...	2	1	...	...	1	1	...	1	...	...	...
10	...	...	...	2	1	1	1	4	...	2	...	...	...	...	...	...	2	...	...	...
9	2	...	1	2	1	3	4	1	1	...	1	...	...	...	...	2	...	2	...	...
8	7	...	5	8	7	4	2	8	3	...	...	...	...	...	...	1	1	...	...	1
7	4	...	10	10	1	4	4	1	...	...	1	...	...	...	1	...	...	...	...	...
6	...	...	12	4	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...
5	1	...	6	1	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	2	4	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
3	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.47 \pm 0.04$

$n = 198$

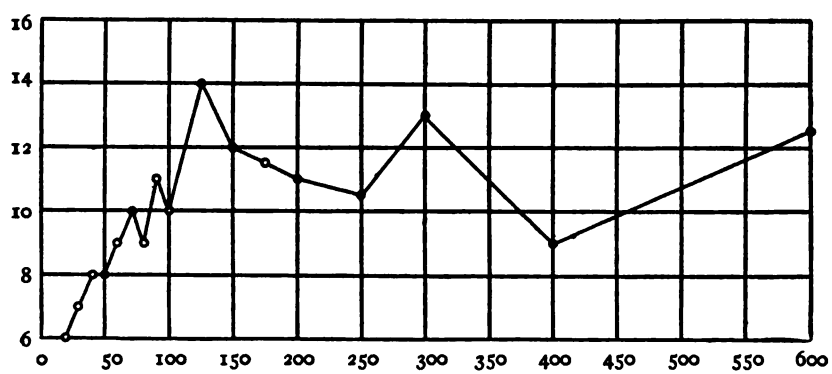

FIG. 8.—Correlation between Education of Sons and Personal Property Values

TABLE LI

CORRELATION BETWEEN PERSONAL PROPERTY VALUES AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Personal Property Assessment of Home, Dollars																			
	0	10	20	30	40	50	60	70	80	90	100	125	150	175	200	250	300	400	500	600
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	1	...	...	...	...	2	1	2	2	2	...	...	1	...	1	...	3	...	...	4
15	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...
14	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1
13	2	...	1	...	...	2	1	...	...	1	...	...	...	...	...	...	...	...	...	1
12	2	...	2	2	2	2	7	4	2	6	1	3	...	...	...	1	5	1	...	1
11	...	...	...	1	1	4	2	2	...	5	1	1	...	...	...	...	1	1	...	...
10	1	...	2	4	1	3	3	2	2	2	...	3	...	...	...	...	...	1	...	...
9	...	...	2	...	...	2	3	1	...	...	...	1	...	...	...	3	...	...	...	...
8	7	...	3	10	4	6	4	7	3	...	...	1	...	...	...	1	...	...	...	...
7	5	...	3	11	7	4	1	...	...	...	1	...	...	...	...	...	...	...	...	...
6	1	...	10	1	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.52 \pm 0.04$

$n = 212$

VALUES OF HOME AND SCHOOLING OF CHILDREN

The real estate assessment indices were taken from the 1915 tax books just as the personal property indices were. Owing to the unalphabetical arrangement of the books, it would have been an extremely laborious and probably unprofitable task to ascertain the total values of the real property owned by the different individuals represented in our investigation. Because of this fact it was decided to take the value of the home in which the family lived, if owned by one of its members, as the real estate index. The assessed valuation was one-third of the actual valuation. The correlation of the real estate assessment indices with the schooling of the sons is 0.63 ± 0.04 (Table LII), and with the schooling of the daughters it is 0.58 ± 0.04 (Table LIII). These figures are calculated from the group of those who owned their homes.

TABLE LII

CORRELATION BETWEEN REAL ESTATE VALUES AND SCHOOLING OF SONS

Years of Schooling of Sons	Real Estate Assessment of Home, Hundreds of Dollars																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
17	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...
16	1	...	...	...	...	...	1	...	...	1	...	...	...	...	2	1	...
15	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
14	2	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...
13	1	...	...	...	...	...	...	...	...	1	1	...	1	...	...	...	4
12	4	...	...	...	2	1	1	3	...	1	2	1	1	1	...	1	2
11	2	...	...	1	1	1	1	1	1	...	...	...	1	3	...	1	...
10	2	...	...	2	1	3	2	2	...	...	...	1	...	...	...	...	...
9	6	...	1	2	4	...	1	3	2	...	...	...	...	1	...	...	...
8	23	...	5	5	5	3	...	...	1	1	1	1	...	1	...	...	1
7	20	...	...	4	5	2	4	1	...	...	...	...	...	...	...	...	...
6	13	...	...	5	2	...	...	...	...	1	...	...	...	...	...	...	...
5	6	...	1	3	1	1	...	...	...	...	...	...	...	...	...	...	...
4	5	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.63 \pm 0.04$

$n = 129$

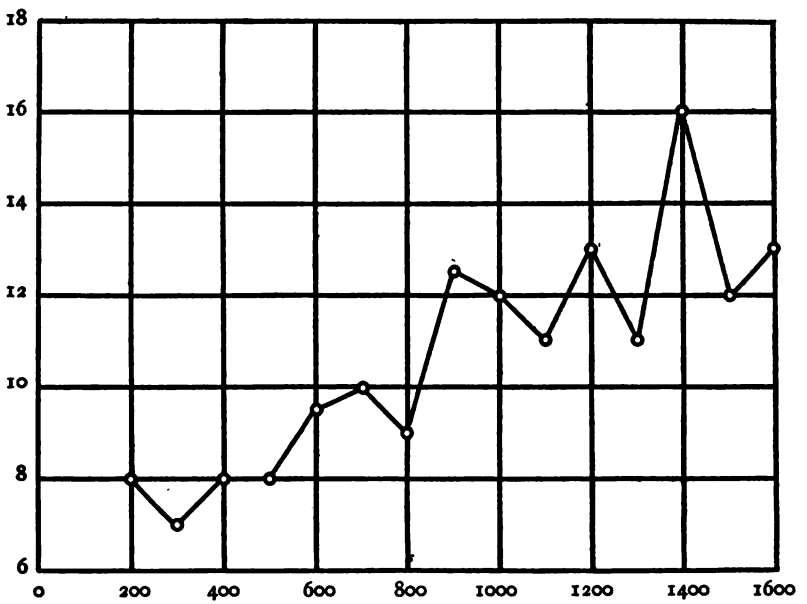

FIG. 9.—Correlation between Education of Sons and Real Estate Values

TABLE LIII

CORRELATION BETWEEN REAL ESTATE VALUES AND SCHOOLING OF DAUGHTERS

Years of Schooling of Daughters	Real Estate Assessment of Home, Hundreds of Dollars																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	4	...	...	...	...	...	1	1	1	4	...	2	1	...	...	1	4
15	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...
14	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	1
13	2	...	...	1	...	...	4	...	...	...	...	...	...	...	1	...	...
12	8	...	1	1	5	1	2	5	4	...	2	2	1	1	...	...	5
11	3	...	...	...	4	2	2	1	1	...	...	...	1	1	...	...	...
10	10	...	...	2	5	...	...	2	2	...	...	1	...	...	...	...	...
9	8	...	...	...	...	1	1	...	...	...	1	...	1	...	...	...	...
8	16	...	2	2	12	4	1	1	1	2	...	4	...	2	...	...	...
7	16	...	...	3	7	2	2	1	...	...	...	...	...	...	...	...	...
6	11	...	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...
5	7	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.58 \pm 0.04$

$n = 144$

SUMMARY AND CONCLUSIONS

The relationships presented in this section may be summed up as follows:

TABLE LIV

Rental value of home correlated with schooling of sons	0.63 ± 0.03
Rental value of home correlated with schooling of daughters	0.64 ± 0.03
Personal property assessment correlated with schooling of sons	0.47 ± 0.04
Personal property assessment correlated with schooling of daughters	0.52 ± 0.04
Real estate assessment correlated with schooling of sons	0.63 ± 0.04
Real estate assessment correlated with schooling of daughters	0.58 ± 0.04

Allowing for the approximate character of the indices, it may be said that economic home conditions in Urbana are closely correlated with the amounts of schooling which the children receive.

SECTION III. SOCIAL AND QUASI-SOCIAL RELATIONSHIPS

NUMBER OF BOOKS IN THE HOME AND SCHOOLING OF THE CHILDREN

The number of books in a home is a rough index of the culture of the home. It does not take into consideration the possibility of using the free public library, an opportunity which has been open to all Urbana homes during recent years.[1] It disregards the differences in the quality

TABLE LV

CORRELATION BETWEEN NUMBER OF BOOKS IN HOME AND EDUCATION OF SONS

Years of Schooling of Sons	Number of Books in Home											
	10	25	50	75	100	150	200	250	300	350	400	500
18	....	....	....	....	....	....	....	....	2	....	....	....
17	....	....	....	....	....	....	....	1	1	....	....	....
16	....	....	2	....	1	....	....	1	....	....	....	2
15	....	....	....	....	....	....	2	....	1	....	....	....
14	....	....	....	....	1	....	2	....	1	....	....	1
13	....	....	....	1	1	2	1	2	....	....	1	....
12	....	3	6	2	3	1	1	2	2	1	....	....
11	....	2	2	1	4	1	1	1	....	1	....	....
10	....	....	7	2	5	1	....	....	....	....	....	....
9	....	3	11	1	1	3	....	1	....	....	....	....
8	4	7	19	5	6	3	1	2	....	....	....	....
7	8	17	8	2	....	2	....	....	....	....	....	....
6	9	5	6	1	1	....	1	....	....	....	....	....
5	4	3	3	....	....	....	1	....	....	....	....	....
4	5	1	1	....	....	....	....	....	....	....	....	....
3	....	2	....	....	....	....	....	....	....	....	....	....

$r = 0.67 \pm 0.03$

$n = 222$

and character of the books, which were probably marked in some cases. Yet, in spite of these limitations, it bears a closer relationship to the number of years of schooling children receive than any other measure used in this study. For the sons the coefficient of correlation between the books in the home and the number of years of schooling is 0.67 ± 0.03 (Table LV); for the daughters it is 0.68 ± 0.02 (Table LVI).

[1] The public library in Urbana has been in a position where it could be of service to the community for more than thirty years.

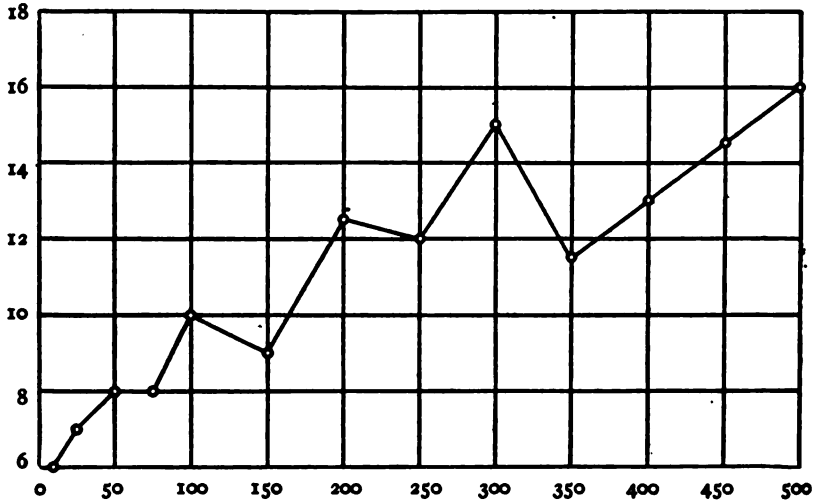

FIG. 10.—Correlation between Education of Sons and Size of Home Libraries

TABLE LVI

CORRELATION BETWEEN NUMBER OF BOOKS IN HOME AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	350	400	500	600
19	....	....	....	....	....	....	....	1	....	....	....	....	....
18	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	1	2	1	3	1	1	2	1	7	1
15	....	....	2	....	....	....	....	....	....	....	....	1	....
14	....	....	....	....	....	....	1	1	....	....	....	2	....
13	....	....	....	....	1	2	2	....	1	....	1	....	....
12	1	4	3	3	13	....	9	1	....	3	....	....	....
11	....	....	5	....	3	2	4	1	....	....	....	....	....
10	1	4	2	4	8	2	1	....	....	....	....	....	....
9	....	4	5	1	1	....	2	....	....	....	....	....	....
8	2	13	16	6	5	1	1	2	....	....	....	....	....
7	3	17	6	1	1	5	....	....	....	....	....	....	....
6	7	6	3	....	....	1	....	....	....	....	....	....	....
5	4	5	....	....	1	....	....	....	....	....	....	....	....
4	....	....	....	....	....	....	....	....	....	....	....	....	....
3	....	1	....	....	1	....	....	....	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....
0	....	1	....	....	....	....	....	....	....	....	....	....	....

$r = 0.68 \pm 0.02$

$n = 231$

HOUSING AND SCHOOLING OF THE CHILDREN

Out of a total of 234 families 34 reported one or more grown individuals not members of the family but living in the home. Housing conditions are measured by number of rooms per individual. In finding this index no distinction was made between children and adults. In general, the housing conditions found in this investigation were quite good. Very little overcrowding existed and, in an appreciable number of cases, it seemed as though the people had more room than they could use conveniently. Housing conditions are probably a reflection of economic status. Measured merely by the number of rooms per individual the relationships which exist between housing conditions and education of sons and daughters are 0.50 ± 0.03 and 0.48 ± 0.03, respectively (Tables LVII, LVIII). If the size of the rooms and the presence or absence of modern conveniences, such as bath and toilet, had been taken into consideration, the correlation would probably have been higher.

TABLE LVII

CORRELATION BETWEEN HOUSING CONDITIONS AND EDUCATION OF SONS

Years of Schooling of Sons	Rooms per Individual in Home					
	½	1	1½	2	3	4
18	.....	.....	.....	.....	2	.....
17	.....	.....	.....	1	1	.....
16	.....	1	1	2	.....	2
15	1	1	.....	.....	1	.....
14	.....	1	4	.....	1	.....
13	.....	2	1	3	3	.....
12	.....	1	12	7	1	.....
11	.....	.....	3	8	2	.....
10	.....	.....	7	5	1	.....
9	1	4	12	4	.....	.....
8	1	16	16	14	2	.....
7	3	9	22	2	.....	.....
6	2	10	8	2	.....	.....
5	4	3	4	.....	.....	.....
4	1	1	4	1	.....	.....
3	.....	.....	2	.....	.....	.....

$r = 0.50 \pm 0.03$

$n = 223$

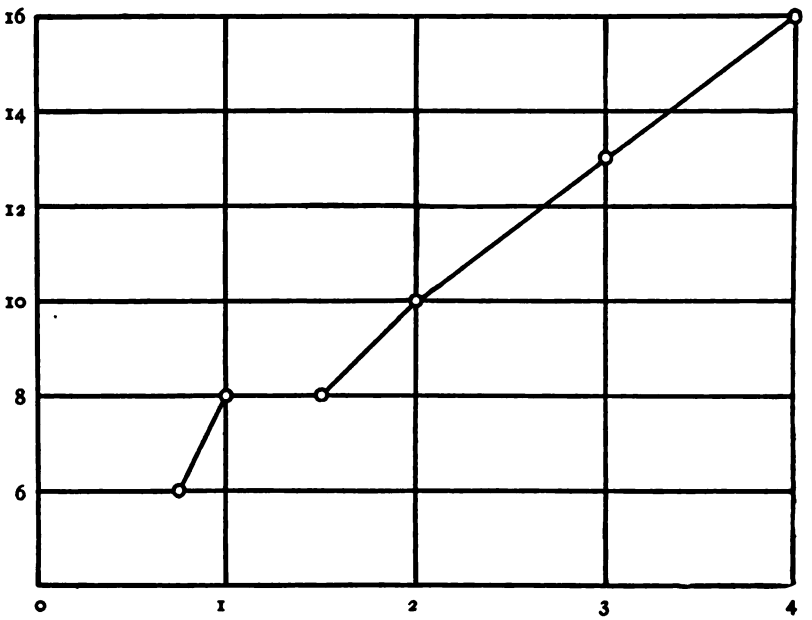

FIG. 11.—Correlation between Education of Sons and Housing Conditions

TABLE LVIII

CORRELATION BETWEEN HOUSING CONDITIONS AND EDUCATION OF DAUGHTERS

Years of Schooling of Daughters	Rooms per Individual in Home					
	½	1	1½	2	3	4
19	.....	.....	.....	.....	1	.....
18	.....	.....	.....	.....	.....	.....
17	.....	.....	.....	.....	.....	.....
16	.....	1	4	8	6	.....
15	.....	.....	.....	1	.....	2
14	.....	.....	1	2	1	.....
13	.....	1	3	2	2	.....
12	2	5	11	18	3	.....
11	.....	1	7	6	1	.....
10	.....	4	11	6	1	.....
9	.....	4	5	2	1	.....
8	2	15	18	9	3	.....
7	3	12	12	4	.....	.....
6	1	7	7	2	.....	.....
5	.....	2	6	2	.....	.....
4	.....	.....	.....	.....	.....	.....
3	.....	.....	2	.....	.....	.....
2	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	.....
0	.....	.....	1	.....	.....	.....

$r = 0.48 \pm 0.03$

$n = 231$

INTERRELATIONSHIPS

Thus far in Part IV the various factors have been considered separately. In reality, they are all interrelated. A few of these interrelationships will be given to show the fallacy which results when conclusions overlook the complex character of social phenomena.

a) Schooling of parents and number of books in the home.—As might be forecasted, there is a close relationship between the schooling of the parents and the number of books found in the home. This correlation, 0.60 ± 0.03 for the fathers (Table LIX) and 0.61 ± 0.03 for the mothers

TABLE LIX

CORRELATION BETWEEN NUMBER OF BOOKS IN HOME AND EDUCATION OF FATHERS

Years of Schooling of Fathers	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	350	400	500	600
20	....	....	1	....	....	....	....	....	....	....	....	....	....
19	....	....	....	....	....	....	1	....	....	....	....	....	....
18	....	....	....	....	....	....	....	1	....	....	....	....	....
17	....	....	....	....	....	....	1	....	....	....	....	....	....
16	....	....	....	....	....	....	....	....	1	1	1	....	1
15	....	....	....	....	1	....	....	....	1	....	1	1	....
14	....	....	....	....	1	....	....	2	....	....	1	2	....
13	....	....	....	....	1	....	....	....	....	....	....	1	....
12	....	4	3	1	2	1	5	3	3	1	1	....	....
11	....	....	1	1	5	1	4	....	1	....	....	....	....
10	....	1	4	1	7	3	7	1	....	....	....	1	....
9	1	2	4	....	3	....	2	....	1	....	....	....	....
8	4	13	5	6	12	4	4	3	2	....	....	1	....
7	4	9	9	1	3	2	1	....	....	....	....	....	....
6	6	8	11	2	2	....	....	....	....	....	....	....	....
5	1	3	3	....	....	1	....	....	....	....	....	....	....
4	2	....	1	....	....	1	....	....	....	....	....	....	....
3	1	....	1	1	....	1	....	....	....	....	....	....	....
2	1	2	1	....	1	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....
0	1	....	1	....	....	....	....	....	....	....	....	....	....

$r = 0.60 \pm 0.03$
$n = 230$

(Table LX), is not so high, however, as that previously noticed between the number of books in the home and the schooling of the children. The difference is not enough to be very significant, however.

b) Number of books in the home and size of family.—The relationship which exists between the number of books in the home and the number of children in that home is slightly negative, -0.10 ± 0.04 (Table LXI).

This shows that the number of books owned by a family is not at all dependent upon the number of people there are to read them.

TABLE LX

CORRELATION BETWEEN NUMBER OF BOOKS IN HOME AND EDUCATION OF MOTHERS

Years of Schooling of Mothers	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	350	400	500	600
15	....	....	....	....	....	....	....	....	....	....	1	....	....
14	....	1	....	....	....	....	....	1	2	....	....	....	....
13	....	....	....	....	1	....	....	....	....	....	1	....	....
12	....	....	4	1	5	1	9	2	4	2	1	4	1
11	....	....	1	....	3	....	1	....	....	....	....	....	....
10	....	....	5	1	7	2	6	3	1	....	1	1	....
9	2	5	6	4	3	1	....	2	1	....	....	....	....
8	6	13	9	5	15	6	9	2	1	....	....	1	....
7	3	10	12	1	1	2	....	....	....	....	....	....	....
6	1	7	4	1	1	1	....	....	....	....	....	....	....
5	1	3	....	....	....	1	....	....	....	....	....	....	....
4	5	3	4	....	1	....	....	....	....	....	....	....	....
3	....	....	....	....	....	....	....	....	....	....	....	....	....
2	2	....	....	....	1	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....
0	1	....	....	....	....	....	....	....	....	....	....	....	....

$r = 0.61 \pm 0.03$

$n = 230$

TABLE XLI

CORRELATION BETWEEN SIZE OF FAMILY AND NUMBER OF BOOKS IN HOME

No. of Children in Family	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	350	400	500	600
10	....	2	1	....	....	....	....	....	....	....	....	....	....
9	1	1	1	....	....	....	....	....	....	....	....	....	....
8	1	1	2	2	....	1	....	....	....	....	....	....	....
7	4	....	4	....	....	2	1	1	....	....	....	1	....
6	1	7	6	1	2	2	1	....	....	1	....	1	....
5	3	3	3	....	4	....	2	1	1	....	....	1	....
4	2	7	9	3	8	....	6	2	1	1	....	1	....
3	4	10	9	3	7	3	5	1	3	....	1	....	....
2	2	7	6	2	12	4	6	4	4	....	3	2	1
1	3	4	5	2	7	2	4	1	....	....	....	....	....

$r = -0.10 \pm 0.04$

$n = 233$

c) Rent and size of family.—To a slight extent the better homes are occupied by the smaller families. The coefficient of correlation between size of family and rental values is also slightly negative, being -0.10 ± 0.04 (Table LXII).

TABLE LXII

CORRELATION BETWEEN SIZE OF FAMILY AND RENTAL VALUES

No. of Children	Rental Values of Home per Month, Dollars										
	10	15	20	25	30	35	40	45	50	55	60
10	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....
8	1	2	3	1	.....	.....	.....	.....	.....	.....	.....
7	2	7	.....	.....	.....	1	1	.....	.....	.....	.....
6	2	9	4	4	1	1	.....	2	.....	.....	.....
5	3	5	.....	2	4	2	.....	.....	1	.....	1
4	4	16	5	3	4	3	3	.....	.....	.....	.....
3	4	14	11	3	5	2	3	1	3	.....	.....
2	7	13	5	4	7	7	4	2	5	.....	1
1	4	6	8	2	6	.....	1	.....	3	.....	.....

$r = -0.10 \pm 0.04$

$n = 234$

d) Schooling of parents and size of family.—That educated parents have smaller families has been observed so often that it has become a matter of common knowledge. When expressed by a coefficient of correlation, this relationship is -0.20 ± 0.04 (Table LXIII). Of

TABLE LXIII

CORRELATION BETWEEN SIZE OF FAMILY AND EDUCATION OF PARENTS

No. of Children	Average Schooling of Parents															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
10	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...
9	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...
8	...	...	...	1	...	...	...	4	1	1	...	...	...	...	...	...
7	1	1	...	1	...	3	2	1	...	2	...	...	1	...	...	...
6	...	...	...	...	2	5	2	7	1	4	...	1	...	...	...	...
5	...	...	...	...	1	1	1	4	3	3	...	2	1	...	...	...
4	...	...	...	...	4	7	7	6	5	3	1	2	1	2	...	...
3	...	1	...	...	7	3	8	9	5	4	2	6	1	...	...	...
2	1	...	...	1	1	5	2	8	8	8	4	5	3	4	1	...
1	...	...	...	...	1	2	3	7	7	5	2	2	...	...	...	...

$r = -0.20 \pm 0.04$

$n = 227$

course, it must be kept in mind that only families that had children were included in this group. It may be that there are more families without children among the better educated. If so, a selection of homes which included such homes in addition to those studied here would reveal a larger negative correlation.

e) Education of children and size of family.[1]—When the entire group is examined, it is seen that the children who came from large families did not go to school so long as those who came from small families. This fact is expressed by the coefficient of correlation, -0.20 ± 0.05 (Table LXIV). This is the same as the relationship which exists

TABLE LXIV

CORRELATION BETWEEN SIZE OF FAMILY AND AVERAGE EDUCATION OF CHILDREN

No. of Children	Average Education of Children No Longer in School														
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
10	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
8	...	1	...	1	2	...	...	...	1	...	...	...	...	...	...
7	...	2	1	4	...	2	...	...	...	1	...	...	1	...	...
6	...	1	...	5	5	1	3	...	2	...	...	...	1	...	...
5	...	...	2	2	2	3	3	...	1	1	...	1	...	...	...
4	1	...	2	8	4	1	8	2	3	1	...	3	...	...	...
3	...	4	2	5	2	7	2	6	4	1	...	...	...	1	...
2	...	1	2	2	5	3	4	2	5	3	2	1	5	1	1
1	...	...	1	2	4	1	1	2	2	2	1	...	1	...	...

$r = -0.20 \pm 0.05$

$n = 180$

between the schooling of the parents and the size of the family. It has already been shown[2] that there is a decided relationship between the schooling of the parents and the schooling of the children. The foregoing coefficient of correlation, then, may be merely another way of expressing the relationship which exists between the schooling of the parents and the size of the family.

[1] In these tables the education of the children was averaged for each family. This gives each family a single index and does not over-weight the large families.

[2] Pp. 43–48.

If the influence of the education of the parents could be eliminated, it might be possible to ascertain the presence or absence of a true relationship between the size of family and the schooling of the children. An attempt to do this was made as follows: The median schooling of parents is eight years for the entire group. The average schooling of the children of each family was increased or decreased by the same number of years that the average schooling of the parents varied from this median. Thus, if the parents averaged seven years and the children averaged six years, the parents would be one year below the median and the index of the children would be increased by one year. Similarly, if the parents averaged twelve years and the children fifteen years, the parents would be four years above the median and the index of the children would be decreased four years. These revised educational averages of the schooling of the children were then correlated with the number of children in each home.

This procedure eliminates the influence of the schooling of the parents. It does not counteract other factors which may act somewhat independently of the education of the parents, such as economic status or number of books in the home. Further, compulsory education influences affect the level of some of the homes of the poorly educated which have large families and tend to counterbalance any negative relationship which may exist. The results do not show any decided correlation. The slight negative relationship, -0.06 ± 0.05 (Table LXV), which was found, is virtually a zero correlation.

A FAMILY INDEX

The fact that the factors thus far considered probably acted conjointly instead of independently in determining the amounts of schooling which the children received suggested that it might be possible to weight the various items in such a way as to give each family an index and then find the relationship which existed between this index and the schooling of the children. This was done as follows: The 25 percentile deviation from the median was found for each of the three items, average education of the parents, number of books in the home, and monthly rental. These figures, which were approximately 2 years, 62½ volumes, and $7.50, respectively, were then divided by five to give more convenient divisions. Each of these divisors, 0.4 year, 12½ volumes, and $1.50, was given a value of one unit. The number of times the respective divisors were

contained in the quantities which represented the average education of the parents, the number of books in the home, and the monthly rental of a family gave the number of units credited to each of these items. The figure representing the units given a family for an item was squared and the sum of the squares for the three items gave the family index. This can be made clear best by a concrete example. A family whose parents have an average education of 8 years, which has one hundred books in the home, and pays $15 a month rent will serve as an illustration of the

TABLE LXV

CORRELATION BETWEEN SIZE OF FAMILY AND SCHOOLING OF CHILDREN, EFFECT OF SCHOOLING OF PARENTS HAVING BEEN ELIMINATED

Average Years of Schooling of Children	Number of Children in Family									
	1	2	3	4	5	6	7	8	9	10
16	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
15	.....	1	1	1	.....	.....	.....	.....	.....	.....
14	2	1	2	2	.....	1	.....	.....	.....	.....
13	.....	1	1	2	.....	.....	1	.....	1	.....
12	.....	7	5	1	.....	1	.....	.....	.....	.....
11	6	2	5	5	2	2	2	1	.....	.....
10	2	8	8	5	4	3	1	.....	.....	.....
9	1	7	6	5	1	3	4	2	.....	1
8	3	1	8	1	3	4	2	2	1	2
7	2	5	1	6	1	4	1	1	.....	.....
6	.....	1	1	2	4	.....	.....	.....	.....	.....
5	.....	1	1	2	.....	.....	.....	.....	.....	.....
4	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	1	.....	.....	.....	.....	.....	.....

$r = -0.06 \pm 0.05$

$n = 178$

method. Dividing 8 years by the educational divisor, 0.4 year, gives 20 units, which is 400 when squared. Similarly, one hundred books when divided by the library divisor, 12½ volumes, gives 8 units, which equals 64 when squared. The rental index, $15, divided by the rental divisor, $1.50, gives 10 units, which, when squared, furnishes 100 more. The sum of 400, 64, and 100, or 564, is the index of this family.

This procedure is purely arbitrary, but the writer thinks that the resulting indices are quantitatively representative of the differences in

the opportunities presented to the children by their respective homes. This method gave the best home an index of 4,289, while the poorest received but 32. The possibilities of the best in contrast with the poorest are, according to the opinion of several people acquainted with both homes, as different as these indices imply. There is a gulf between them.

The coefficients of correlation between this family index and the education of the children are higher than those expressing any single relationship. They are the same, 0.73±0.02 (Tables LXVI, LXVII) for both sons and daughters.

TABLE LXVI

CORRELATION BETWEEN FAMILY INDEX AND SCHOOLING OF SONS

Years of Schooling	Family Index in Hundreds																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
18																								1					1						
17											1													1											
16								1			2			1																			2		
15										2								1																	
14									1			1			1			1										1							
13												1			2	1					1		1	1		1								1
12			2				3		2		5				1	1		1	2	1															
11			1			2	2			1	2		2		1				1									1							
10					2	4	1	1			1		3		1																				
9		1	3		6	1	2		2		1	1			1		1		1																
8		2	6	4	14	5	7			3	1			1				1	1		1														
7		2	5	6	13	2	5		1	1																									
6	1	5	4	2	4	2			2																										
5	3	1	4	1	2				1																										
4	1	4	1		1																														
3			2																																

$r = 0.73 \pm 0.02$

$n = 215$

TABLE LXVII

Correlation between Family Index and Schooling of Daughters

| Years of Schooling | Family Index in Hundreds | | |

SUMMARY AND CONCLUSIONS

The relationships presented in this chapter are shown in Table LXVIII.

TABLE LXVIII

Number of books in home correlated with schooling of sons...	0.67±0.03
Number of books in home correlated with schooling of daughters	0.68±0.02
Number of rooms per individual correlated with schooling of sons	0.50±0.03
Number of rooms per individual correlated with schooling of daughters	0.48±0.03
Number of books in home correlated with schooling of father..	0.60±0.03
Number of books in home correlated with schooling of mother..	0.61±0.03
Number of books in home correlated with size of family.....	−0.10±0.04
Rental values correlated with size of family.....	−0.10±0.04
Schooling of parents correlated with size of family.....	−0.20±0.04
Schooling of children, uncorrected, correlated with size of family	−0.20±0.04
Schooling of children, corrected, correlated with size of family..	−0.06±0.05
Schooling of sons correlated with family index.....	0.73±0.02
Schooling of daughters correlated with family index.....	0.73±0.02

The number of books in a home is the best single index of the probable educational level which the children may expect to reach.

The number of books in a home is closely correlated with the schooling of the parents.

The various indices used in this part of the study are more or less interrelated.

As measured by the method used here, size of family has only a slight negative correlation with the schooling of the children.

SECTION IV. OCCUPATIONAL AND OTHER GROUP RELATIONSHIPS

OCCUPATIONS OF THE FATHER

The occupations of the fathers (Table LXIX) show that this group contains representatives from almost every stratum of the economic life of the community. Most of the occupations are represented by too small a number, however, to furnish comparisons. The first thirteen occupations will be compared with respect to the schooling of the fathers, the rent of the homes, the number of books in the homes, and the schooling of the children.[1]

[1] The group "Farmers" is not on a par with the others. Six of the 13 fathers are dead, having been deceased in some cases for fifteen years. All of these families are living in town. Most of these farmers have retired as far as any active farm life is concerned.

TABLE LXIX

Occupations of Fathers

Occupation	No. Reported	Occupation	No. Reported
Laborer	24	Furnace contractor	1
Carpenter	15	Lumber dealer	1
Retired farmer	15	Pump-dealer	1
Farmer	13	Tool-polisher	1
Painter and paper-hanger	8	Plumber	1
Real estate and insurance	8	Roadster	1
Machinist	6	Shop foreman	1
Stationary engineer	6	Coal-dealer	1
Blacksmith	5	Railroad official	1
Grocer	5	Grocery clerk	1
Janitor	5	Postmaster	1
Evangelist and minister	5	Foreman for brick company	1
Merchant	5	Clothier and dry goods merchant	1
Druggist	4	Manufacturer	1
Railroad conductor	3	Optician	1
Salesman	3	Undertaker	1
Physician	3	Road boss on Big Four	1
Driver of ice wagon	3	Horseshoer	1
Grain-buyer	2	Jailor	1
Car-repairer	2	Superintendent of signals and water service, Big Four	1
Contractor	2	Roofing business	1
Tinner	2	Carpenter superintendent	1
Railroad engineer	2	Tailor	1
City fireman	2	Ditcher	1
Printer	2	Overseer of water-main laying	1
Banker	2	Implement dealer	1
Policeman	2	Contracting excavator	1
Laundryman	2	Dentist	1
Jeweler	2	Sheriff	1
Agent and solicitor	2	Veterinary surgeon	1
Carpenter contractor	2	Foreman of water service on Big Four	1
Teamster	2	Feed-store clerk	1
Teacher	2	Manager of cold storage plant	1
Cement contractor	2	Engine inspector	1
Roundhouse foreman	1	Drayman	1
Bank cashier	1	Retired minister	1
Mine-owner	1	Bookkeeper	1
Foundry-owner	1	Night watchman	1
Barber	1	Railroad fireman	1
Ticket agent	1	Hostler	1
Butcher	1	Brickmason	1
Section foreman	1	Mail-carrier	1
County superintendent of schools	1		
Musician	1		

TABLE LXIX—*Continued*

Occupation	No. Reported	Occupation	No. Reported
Mail clerk	1	Runs ice-cream wagon	1
Restaurant keeper	1	Itinerant photographer	1
House-moving contractor	1	Justice of peace	1
Deliveryman	1	Foreman for contractor	1
Postal clerk	1	Cigar-factory foreman	1
Horse business	1	Bricksetter	1

a) *Occupations and education of fathers.*—The number of individuals (Table LXX) in several of the groups is too small to furnish any very

TABLE LXX

Years of Schooling	Education of												
	Laborers	Carpenters	Retired Farmers	Farmers	Painters and Paper-Hangers	Real Estate and Insurance Men	Machinists	Stationary Engineers	Blacksmiths	Grocers	Janitors	Ministers	Merchants
16	....	....	....	....	....	....	....	....	....	....	....	2	....
15	....	....	....	....	....	1	....	....	....	....	....	2	....
14	....	....	....	....	....	1	....	....	....	....	....	....	....
13	....	....	....	....	....	1	....	....	....	....	....	....	....
12	1	....	4	1	....	1	....	1	....	....	....	....	1
11	....	....	1	1	1	2	1	....	....	....	....	....	1
10	....	1	3	1	....	1	....	....	1	1	....	....	2
9	1	2	....	....	....	1	....	....	....	....	1	....	....
8	2	5	3	3	4	....	1	1	....	4	1	1	1
7	5	4	1	2	2	....	2	2	1	....	3	....	....
6	8	1	1	2	....	....	1	2	1	....	....	....	....
5	3	1	....	....	1	....	....	....	....	....	....	....	....
4	2	....	....	1	....	....	....	....	....	....	....	....	....
3	1	1	1	....	....	....	1	....	....	....	....	....	....
2	1	....	1	1	....	....	....	....	2	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....
0	....	....	....	1	....	....	....	....	....	....	....	....	....
Median years of schooling	6	8	10	7	8	10½	7	7	6	8	7	15	10

reliable conclusions. The material, however, is very suggestive. It appears that an eighth-grade education is the minimum for the occupations of real estate and insurance men, grocers, and merchants. For

most of the others a seventh-grade education is near the minimum. Laborers are still lower, with an average education of but six years. Ministers are the best-schooled group. One of their number, however, belongs to one of the smaller denominations which cares little for an educated clergy. He is really a laborer by vocation and a preacher by avocation.

b) Occupations and rent.—In this comparison (Table LXXI) the retired farmers, the real estate and insurance men, the grocers, the ministers, and the merchants make the best showing. Laborers make the poorest. The median rentals of the other occupational classes fall in the $15 and $20 groups.

TABLE LXXI

	Monthly Rental Values (in Dollars) of Homes of											Median Rental
	10	12.50	15	17.50	20	25	30	35	40	45	50	
Laborers	15	5	....	1	2	....	1	....	....	....	....	$10
Carpenters	2	2	5	....	4	1	....	1	....	....	....	15
Retired farmers	....	1	1	....	....	1	5	1	1	1	4	30
Farmers	1	2	5	....	2	1	2	....	....	....	....	15
Painters and paperhangers	1	1	1	1	2	....	1	1	....	....	....	18.75
Real estate and insurance men	....	....	....	....	1	....	2	1	1	....	3	37.50
Machinists	....	1	3	1	....	....	1	....	....	....	....	15
Stationary engineers	....	....	1	2	1	1	1	....	....	....	....	18.75
Blacksmiths	....	1	3	....	....	1	....	....	....	....	....	15
Grocers	....	....	1	....	1	....	2	1	....	....	....	30
Janitors	....	1	2	....	....	....	....	1	1	....	....	15
Ministers	....	....	1	....	....	2	....	....	2	....	....	25
Merchants	....	....	....	....	1	....	1	1	2	....	....	35

c) Occupations and number of books in home.—The influence of a scholastic occupation appears here (Table LXXII). The ministers have libraries which correspond to their education and occupation. On the other hand, laborers are almost without libraries, for the average number of books in a laborer's home is less than twenty-five. This means that these homes have almost no books other than the Bible, a couple of hymn-books, and the children's schoolbooks. The remainder of the occupational groups fall between these extremes in a close correlation with economic position.

d) Occupations of fathers and schooling of their children.—In this comparison (Tables LXXIII, LXXIV) the small number of cases in some of

the groups is further complicated by the fact that some of the families had more children than others. Some families had but one child, while some had eight or ten. Hence it is probable that the medians obtained by combining boys and girls are more reliable than the medians for either sex alone. This procedure shows the children of real estate and

TABLE LXXII

No. of Books in Homes of	Volumes													Median No. of Volumes
	10	25	50	75	100	150	200	250	300	350	400	500	600	
Laborers	6	10	2	1	3	...	...	...	...	...	...	...	...	25
Carpenters	3	2	5	...	3	...	1	1	...	...	...	...	...	50
Retired farmers	...	3	2	...	2	3	1	1	2	1	...	...	...	150
Farmers	1	3	6	...	2	...	...	1	...	...	...	...	...	50
Painters and paper-hangers	...	3	...	1	2	1	1	...	...	...	...	...	...	87½
Real estate and insurance men	...	...	...	...	2	...	2	...	2	...	1	1	...	250
Machinists	...	2	...	2	1	...	1	...	...	...	...	...	...	75
Stationary engineers	...	1	2	2	...	...	...	1	...	...	...	...	...	62½
Blacksmiths	...	...	3	...	1	...	1	...	...	...	...	...	...	50
Grocers	...	1	...	3	1	...	...	...	...	...	...	...	...	75
Janitors	...	1	2	1	...	1	...	...	...	...	...	...	...	50
Ministers	...	...	...	...	1	1	...	...	1	...	...	...	1	350
Merchants	...	...	1	1	1	...	1	1	...	...	...	...	...	100

TABLE LXXIII

Education of Sons of	Years of Schooling															Median
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Laborers	3	3	2	7	9	1	1	...	...	...	1	...	...	...	...	7
Carpenters	...	...	...	3	2	...	1	1	...	...	...	...	1	...	...	8
Retired Farmers	...	...	1	2	2	2	2	2	2	1	1	...	2	1	1	10
Farmers	...	2	5	...	4	1	1	1	4	...	...	...	1	1	...	8
Painters and paper-hangers	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	10
Real estate and insurance men	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	13
Machinists	...	1	...	4	2	...	...	1	1	...	...	...	...	...	...	7
Stationary engineers	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	7½
Blacksmiths	...	...	1	...	1	2	...	...	...	...	...	1	...	...	...	9
Grocers	...	...	...	1	2	...	2	...	...	...	...	...	...	...	...	8
Janitors	...	...	...	2	...	2	...	...	1	...	...	...	...	...	...	9
Ministers	...	...	...	1	2	...	...	1	1	...	...	...	...	...	...	8
Merchants	...	...	...	...	1	1	...	1	2	...	...	...	...	...	...	11

TABLE LXXIV

Education of Daughters of	Years of Schooling																Median	Median of Sons and Daughters
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Laborers	1	...	4	1	6	7	1	4	...	2	...	...	...	...	...	...	...	8	7
Carpenters	...	...	...	2	3	6	...	1	3	1	...	...	...	...	...	...	...	8	8
Retired farmers	...	...	3	2	...	1	...	2	2	6	...	...	2	3	...	...	1	12	11
Farmers	...	...	...	6	3	9	...	...	...	1	...	...	...	1	...	...	...	8	8
Painters and paper-hangers	...	...	1	...	2	...	...	2	1	1	...	...	...	...	...	...	...	10	10
Real estate and insurance men	...	...	...	...	...	...	...	...	1	...	...	...	...	4	...	...	...	16	15
Machinists	...	...	...	...	4	5	...	2	1	...	...	...	...	...	...	...	...	8	8
Stationary engineers	...	...	...	...	...	2	...	1	...	1	...	...	...	...	...	...	...	9	8
Blacksmiths	...	...	...	1	...	3	...	...	2	2	1	...	...	...	...	...	...	11	9
Grocers	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	10	10
Janitors	...	...	...	...	2	1	...	1	1	1	...	...	...	...	...	...	...	9	9
Ministers	...	...	...	...	1	...	...	...	...	...	1	...	...	2	...	...	...	14½	11
Merchants	...	...	...	...	...	2	...	...	...	3	...	...	...	...	...	...	...	12	11½

insurance men to be the best educated. Next come the children of merchants, retired farmers, ministers, grocers, and painters and paper-hangers. The most poorly educated are the children of laborers.

THE TRUANT OFFICER'S REPORT

It was thought that it might prove interesting and perhaps instructive to examine those families which have had to be visited by the truant officer. The woman who occupies this position in Urbana has been in charge of the work for twelve years. Through the performance of the duties of her office she has become acquainted with those families whose children were of legal school age but did not attend school as the statutes require. The writer took a list of the names and addresses of the families that furnished the data which have been presented in Part IV to this woman and requested her to mark all the families which she had visited in her official capacity. This she very kindly did. These families were then studied, with respect to the schooling of the parents, the number of books in the home, the rental value of the home, and the schooling of the children, and compared with the positions of the remainder of the families as to these items. It is probable that there are other families included in this study who moved to Urbana after their children were fourteen years of age or older who would have been included in the group that furnished work for the truant officer if they had always lived in Urbana.

For convenience in discussing the data the families were divided as follows: Group A, those families who have been visited in an official

way by the Urbana truant officer—30 families; Group B, those who have not received any official visits from the truant officer since they have lived in Urbana—204 families.

a) ***Education of parents.***—The parents of Group A are less extensively schooled than the parents of Group B (Table LXXV). The

TABLE LXXV

EDUCATION OF FATHERS AND MOTHERS

YEARS OF SCHOOLING	GROUP A		GROUP B	
	Fathers	Mothers	Fathers	Mothers
20			1	
19			1	
18			1	
17			1	
16			4	
15			4	1
14		1	6	3
13			2	2
12	3	1	21	33
11			13	5
10	2	2	23	25
9		2	13	22
8	6	4	48	63
7	6	9	24	21
6	7	1	22	14
5	1	2	7	3
4	1	7	3	6
3	2		2	
2	1		4	3
1				
0	1	1	1	
Median schooling	7.33 years	7.44 years	8.78 years	8.85 years

Difference between medians for fathers, 1.45 ± 0.25 years
Difference between medians for mothers, 1.41 ± 0.35 years

fathers in the homes which received the official visits of the truant officer went to school 1.45 years less on the average than the fathers in those homes which did not receive an official visit from the truant officer. They received a median schooling of 7.33 years as compared with 8.78 years for the second group. The median of Group A mothers is 7.44 years; of Group B mothers it is 8.85 years.

b) Number of books in home.—The median library of Group A, 50 volumes, is one-half the size of the median library of Group B (Table LXXVI).

c) Rental values of home.—Group B families live in a much better class of homes than Group A families (Table LXXVII). The median home in Group A has a rental value of $12.50 per month, while the median home in the other group would rent for $20.

TABLE LXXVI

NUMBER OF BOOKS IN HOMES

No. of Volumes	Group A	Group B
0–10	8	13
25	6	37
50	8	38
75	1	12
100	2	38
150	1	14
200	2	23
250	.....	10
300	1	8
350	.....	2
400	.....	4
500	1	4
600	.....	1
Median	50	100

Difference between medians, 50 ± 10 vols.

TABLE LXXVII

MONTHLY RENTAL VALUES OF HOMES

	Group A	Group B
$10	8	18
12.50	9	15
15	8	45
17.50	.....	7
20	2	28
22.50	.....	3
25	1	15
27.50	.....	1
30	1	26
35	.....	16
40	.....	12
45	1	4
50	.....	12
60	.....	2
Median	$12.50	$20

Difference between medians, $7.50 ± $0.70

d) Education of the children.—The differences between the schooling of the children of Group A and Group B (Table LXXVIII) are somewhat greater than the parental difference in education already noted. The sons of Group A received an average of 7.35 years of schooling, while those of Group B received an average of 8.94 years. The daughters of the first group averaged 8.15 years, while those of the second group averaged 10.16 years.

e) Causes of truancy.—The truant officer gave a rough classification of the causes of truancy. In five homes the main cause seemed to be indifference on the part of the parents. In eleven others poverty was the thing which was most evident. The children from such homes did not have the clothes necessary to enable them to attend school, or the parents kept them out to work. With the remainder the causes were

more complex and, in some cases, outside of the home. In one case a boys' club was an important factor. In another an unsympathetic teacher, combined with rigid application of school rules and regulations, proved to be almost more than home and truant officer could counteract. In other cases the cause was the slackening of home supervision until the parents did not know what the boy or girl was doing. Truancy,

TABLE LXXVIII

EDUCATION OF SONS AND DAUGHTERS

YEARS OF SCHOOLING	GROUP A		GROUP B	
	Sons	Daughters	Sons	Daughters
19	.....	.....	.....	1
18	.....	.....	2	.....
17	.....	.....	2	.....
16	.....	1	6	18
15	1	.....	2	3
14	.....	.....	5	4
13	.....	1	8	7
12	1	3	19	36
11	.....	1	13	14
10	1	3	12	19
9	2	.....	18	12
8	8	10	40	38
7	10	8	26	24
6	7	4	14	13
5	8	4	4	6
4	1	.....	6	.....
3	.....	.....	2	2
2	.....	.....	.....	.....
1	.....	.....	.....	.....
0	.....	.....	.....	1
Median education	7.35 years	8.15 years	8.94 years	10.16 years

Difference between median education of sons, 1.49 ± 0.22 years
Difference between median education of daughters, 2.01 ± 0.30 years

however, did not lead to early elimination in those cases where the better homes were concerned. Almost without exception the children from the better homes—they can be told by their superior status in schooling, library, or rent—continued into the high school and, in some cases, into college.

POVERTY AND HOME CONDITIONS

An attempt was made to measure the amount of poverty and destitution present in the 234 families through the records of the United

Charities' office. A conference with the superintendent disclosed the fact that only three of these families had received organized aid during the existence of the local United Charities organization, a period of two years. These families were the families of two laborers and a carpenter. The parents were poorly educated, as were the children. They were not, however, the most poorly or the least educated of those studied. Several other families were worse off educationally and economically, but were self-supporting. The writer estimated, judging from the view obtained through the front door when gathering the data, that about 10 per cent of the homes feel the pinch of poverty at times. This condition was always accompanied by the absence of the father from the home or by poorly educated parents.

CAUSES OF ELIMINATION

After a part of the data had been gathered, it occurred to the writer that it might be of value to ask the causes of the failure of the children to secure as good an education as it seemed that they might have done. Accordingly questions were asked to secure this information. The results of such a crude method cannot be accurate, but they are suggestive. The causes of elimination are given in Table LXXIX. It is

TABLE LXXIX

Had to work	4
School too far away	1
Moved about	2
Failed in studies	2
Disliked school	2
Sickness	5
Did not want to go to school; could have gone	16
Country schools	12

recognized that some of these replies may have been given merely to please the person asking the questions. The frankness and readiness with which the replies were given, however, leads the writer to think that these replies were the usual ones that these people made to similar questions on other occasions. The major rôles which opportunity and mere whims on the part of the children played in determining the lengths of their schooling leaves but a minor part for economic pressure. Probably but few of these poorly educated children could not have gone to school for a year or two more if those in the home had felt the value of such a course and if there had been the opportunity.

EVIDENCES OF ENVIRONMENTAL MOLDING

It has been a common observation of teachers and others that the children of large families are not all alike in their characteristics. Physically there is much variability. This is likewise true when intellectual traits are considered. In this group of 234 families, however, it was

TABLE LXXX*

ENVIRONMENTAL MOLDING

DISTRIBUTION OF CHILDREN BY FAMILIES AND EDUCATION

Family No.	Years of Schooling																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	...	...	...	...	...	...	7	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	1	5	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	4	2	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	4	...	1	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	1
8	...	...	...	...	...	...	...	...	4	1	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
10	...	...	...	...	...	...	...	...	...	...	...	1	6	...	...	...	1
11	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...
12	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
15	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	...
16	...	...	...	...	3	2	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	2	...	...	2	...	...	...	...	...
18	...	...	...	...	...	...	...	...	2	...	4	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	...
20	...	...	...	...	...	1	4	2	...	...	...	...	...	...	...	...	...
21	...	...	...	...	1	...	2	3	...	...	...	...	...	...	...	...	...
22	...	...	...	3	1	...	3	1	...	...	...	...	...	...	...	...	...
23	...	...	...	1	...	1	...	2	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	2	...	3	1	...	1	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	1	1	2	...	...	...	...	...
26	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2
27	...	...	...	...	...	...	...	...	2	1	1	1	...	...	...	...	...
28	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...
29	1	...	...	...	2	3	3	...	...	...	1	...	...	...	...	...	...
30	...	...	2	...	3	3	2	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	1	1	1	...	...	1	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	1	...	2	...	1	...	...	...	...	...
33	...	...	...	...	...	...	...	1	...	1	1	1	...	...	...	...	...
34	...	...	...	...	...	...	2	1	...	...	1	...	...	...	...	...	...

* This table should be read thus: Family No. 1 had seven children, all of whom received 6 years of schooling; family No. 10 had eight children, one received 11 years of schooling, six, 12 years, and one, 16 years.

observed that there was frequently a marked uniformity in the amounts of schooling which the children of a family received. In an attempt to learn how frequently these phenomena appeared, all families which contained four or more children who had completed their schooling were examined. There were thirty-four such families (Table LXXX). In more than one-half of them, all the children of a family received nearly the same amounts of schooling. In many cases where there was variability it could often be explained by a change in the environment, such as resulted from moving from one town to another. In family No. 1 the children attended a country school which offered only limited opportunities. The children of family No. 2 attended a German parochial school which offered but seven years of schooling.

It is probable that the children of these thirty-four families are as variable in native characteristics as other children. Hence the uniformity present must be explained by crediting it to the coercive effect of the home and community environment.

SUMMARY AND CONCLUSIONS

Ninety-eight different occupations were represented among the 234 families.

One-tenth of the fathers were common laborers.

Occupations of fathers and home conditions, such as schooling, size of library, and rental values of homes, were closely related.

Truancy, when due to specific home causes, was found mainly in the homes of the poorer and less educated.

Poverty and indifference on the part of the parents were the most frequent causes of truancy.

Only three of the families received organized charitable assistance during the past two years. About 10 per cent of the homes probably felt the pinch of poverty at times. All these were homes of poorly educated parents or had experienced a break in the home life due to death or domestic troubles.

It is probable that lack of an opportunity or the lack of an appreciation of the value of education by those in the home was responsible, in the main, for most early eliminations.

The home and community environment "molded" some of the large families to a marked uniformity with respect to the number of years of schooling which the children received.

PART V

THE IMPORTANCE OF ENVIRONMENTAL INFLUENCES

The data presented in this part of the report were secured through personal visits to 32 homes in which adopted children had been reared. In one of these homes the adopted child had been reared in the country; the data about this individual were rejected on further consideration as not being comparable with the others. The remaining 31 homes were represented by 39 adopted children. While the writer was gathering the information it was discovered that 7 of these children were the offspring of relatives of the foster-parents. To eliminate entirely the factor of heredity these 7 were discarded. This left 28 homes containing 32 foster-children, none of whom was related to his or her foster-parents.

The main original data, exclusive of facts regarding occupations of the parents,[1] are presented here (Table LXXXI).

Date of Birth of Children.—These adopted children were born at various periods during a relatively long stretch of time. Thirty-four years elapsed between the birth of the first and the birth of the last. It follows that educational opportunities have changed much during the different decades in which they have been educated. It is also true that the foster-parents, reared a generation ago, had a more restricted educational opportunity than those of the present generation. This wide range of time must be kept in mind when the relationship between the education of the parents and the education of the children is considered. The educational opportunities of the children have been more nearly constant than those of the parents, for the state university has been in full operation during the entire period that any of these children might have attended.

Age when adopted.—In 28 of the 29 cases in which the facts were available the children were adopted at or before the age of twelve (Table LXXXII). Nine were adopted before they were two years of age. The date of adoption, however, was not always the date when the foster-home assumed control of the child.

[1] This information was collected with the explicit understanding that it would be treated confidentially. By presenting the occupations separately it is thought that no confidences are violated.

TABLE LXXXI*

No. of Child	Nativity of		Years of Schooling		No. of Books in Home	Financial Status*	Rental Values of Home	Adopted Children			Family Index
	Father	Mother	Father	Mother				Date of Birth	Sex	Years of Schooling	
1	U.S.	U.S.	8	8	250	A	$45	1868	F	12	1,700
2	U.S.	U.S.	8	8	100	A-B	20	1872	F	11	633
3	U.S.	U.S.	10	10	200	A	40	1861	F	16	1,610
4	Eng.	U.S.	6	6	50	B	12	1866	F	8	305
5	U.S.	U.S.	10	10	200	A	40	1866	M	16	1,610
6	U.S.	U.S	.....	9	250	A	35	1872	F	12	1,458
7	U.S.	U.S.	9	14	100	A	50	1882	F	15	1,994
8	U.S.	U.S.	15	8	300	A-B	20	1884	M	12	1,266
9	Eng.	U.S.	9	7	100	B	25	1879	F	9	753
10	.....	.....	.....	8	.....	A	.....	1887	F	13	.....
11	U.S.	U.S.	20	12	500	A	50	1886	F	16	4,289
12	Ger.	U.S.	2	8	100	B	40	1890	F	9	962
13	.....	U.S.	.....	11	100	A-B	30	1888	F	15	1,248
14	U.S.	U.S.	8	9	100	B	15	1890	M	9	605
15	U.S.	U.S.	8	8	250	A	35	1877	M	18	1,329
16	U.S.	U.S.	8	9	100	B	15	1882	F	6	605
17	U.S.	U.S.	8	8	150	A	35	1897	M	10 (in school)	1,073
18	U.S.	U.S.	10	11	200	A	50	1894	M	9	2,021
19	Ger.	Ger.	10	7	200	A-B	40	1895	F	10	2 074
20	U.S.	U.S.	8	10	100	B	25	1890	F	12	882
21	U.S.	U.S.	8	8	20	B	20	1901	F	8 (in school)	573
22	U.S.	U.S.	7	7	10	B	10	1886	M	9	371
23	U.S.	U.S.	10	12	75	B	15	1880	M	8	920
24	U.S.	U.S.	12	14	100	A	30	1880	F	13	1,553
25	U.S.	U.S.	10	12	75	B	15	1898	M	6	920
26	U.S.	U.S.	14	14	150	A-B	30	1884	M	11	1,769
27	U.S.	U.S.	12	12	200	A	30	1878	F	13	1,556
28	Ger.	Irish	10	10	200	A	25	1890	M	11	1,137
29	Ger.	U.S.	8	8	250	A	35	1876	F	14	1,329
30	Ger.	Irish	10	10	200	A	25	1891	F	11	1,137
31	Ger.	U.S.	8	8	250	A	35	1891	F	16	1,329
32	Ger.	Ger.	7	6	250	B	10	1890	F	7	777

* The families were grouped as follows: A, well-to-do; B, average; A-B, between average and well-to-do.

In a number of cases the court records showed that the child had been living with the foster-parents for years before legal adoption was effected. It is probable that this was true in other cases, although no statement of the fact appeared in the adoption records.

TABLE LXXXII

AGE WHEN ADOPTED

Age, Years	No.	Age, Years	No.
1	8	8	2
2	1	9	0
3	1	10	0
4	5	11	2
5	3	12	1
6	3	24	1
7	2		

Reasons for adoption.—These children were adopted because they were public charges or were about to become so. Enough was told by the court records to make it plain that the history of each case was the

TABLE LXXXIII

CAUSES OF DEPENDENCY*

	No. of Cases
Parents dead	7
Mother dead	7
Father dead	2
Father dead, mother abandoned child	2
Mother dead, father abandoned child	3
Father dead, mother remarried	1
Parents unable to support	1
Father dead, mother unable to support	1
Mother dead, father unable to support	1
Abandoned by parents	1
Foundling	2
Illegitimate	2

*These are condensed from the remarks found on the court records under the section devoted to this subject.

history of a tragedy (Table LXXXIII). The records were brief and meager, but they were all of the same general tone, such as tales of the death of father or mother, inefficiency on the part of father or mother,

and desertion of an unwelcome child. In other words, these children, almost without exception, were born under the most unpromising conditions, conditions which would suggest weakness of hereditary stock. There is nothing in their origins to indicate a single superior child. Not a single home left property for the support of the child. All of the parents were poor. They were adopted into homes which were childless or into the homes of relatively wealthy parents who, after their own children had grown up, still desired to have a child in the household. Three children, including those adopted, represented the largest number found in any of these homes.

Nativity of foster-parents.—Most of the parents were native born. Those who were not were German, English, or Irish.

Occupations of foster parents.—A rather wide array of occupations was represented by the foster-parents (Table LXXXIV). Only one father

TABLE LXXXIV

OCCUPATION OF FOSTER-PARENTS

Occupation	No.	Occupation	No
Retired farmer	3	Merchant	1
Minister	3	Painting contractor	1
Car-inspector	1	Pharmacist and grocer	1
Carpenter	1	Railroad engineer	1
Carpenter and contractor	1	Rural mail-carrier	1
Cigar-maker	1	Section foreman	1
Farmer and school-teacher	1	Shop foreman	1
Fruit farmer and carpenter	1	Shop helper	1
Garage-owner	1	Tailor	1
Grocer	1	Teacher and telegraph operator	1
Insurance man	1	Traveling salesman	1
Laborer	1	University professor	1

was a common laborer. The remainder were distributed among the various business, industrial, and professional activities of this community.

Education of foster-parents and of children.—The relationship which exists between the education of the children and the education of the foster-parents is not very close, being only 0.32 ± 0.11 (Table LXXXV). The lack of opportunity under which some of the older parents were reared may be responsible for this in a large measure.

When the amounts of schooling which the foster-children received are examined, it is seen that they fared very well. One-half of these

children received a high-school education or better, and only 4 of them failed to go to the high school for at least a few months. In comparison with the average number of years of schooling which their foster-parents received, 22 of these children received more education, 1 the same, and 6 less. When their origins are taken into consideration it seems that a large amount of credit must be given to the new environment into which adoption transplanted them.

TABLE LXXXV

CORRELATION BETWEEN EDUCATION OF FOSTER-PARENTS* AND EDUCATION OF ADOPTED CHILDREN

Years of Schooling	Average Years of Schooling of Parents											
	5	6	7	8	9	10	11	12	13	14	15	16
18				1								
17												
16				1		2						1
15							2					
14				1								
13				1				1	1			
12				1	2		1					
11				1		2				1		
10									1			
9	1		1	2		1						
8		1					1					
7		1										
6				1			1					

$r = 0.32 \pm 0.11$

$n = 30$

* The education of the mother is used where the average could not be found because the education of the other parent was unknown.

Number of books in home and education of adopted children.—There is a slightly closer relationship between the education of the adopted children and the number of books in the home than the previous correlation (Table LXXXVI). The coefficient is 0.42 ± 0.10. In one case at least this is lowered by the fact that a library had been inherited.

Rental value of home and education of adopted children.—The main reason for the adoption of these children was an economic one. They were dependent. If these homes were much alike in their social attitudes, the education of the adopted children was determined largely by the economic opportunities of the foster-homes. This seems to have been the case for the relationship between rental value of home and

education of children is higher than the preceding one. It is 0.60±0.08 (Table LXXXVII).

TABLE LXXXVI

CORRELATION BETWEEN NUMBER OF BOOKS IN HOME AND EDUCATION OF ADOPTED CHILDREN

Years of Schooling	Number of Books in Home												
	10	25	50	75	100	150	200	250	300	350	400	450	500
18	....	....	....	....	....	....	....	1	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	....	....	2	1	....	....	....	....	1
15	....	....	....	....	2	....	....	....	....	....	....	....	....
14	....	....	....	....	....	....	....	1	....	....	....	....	....
13	....	....	....	....	1	....	1	....	....	....	....	....	....
12	....	....	....	....	1	....	1	2	....	....	....	....	....
11	....	....	....	....	1	1	2	....	....	....	....	....	....
10	....	....	....	....	....	....	1	....	....	....	....	....	....
9	1	....	....	....	3	....	1	....	....	....	....	....	....
8	....	....	1	1	....	....	....	....	....	....	....	....	....
7	....	....	....	....	....	....	....	1	....	....	....	....	....
6	....	....	....	1	1	....	....	....	....	....	....	....	....

$r = 0.42 \pm 0.10$
$n = 29$

TABLE LXXXVII

CORRELATION BETWEEN RENTAL VALUE OF HOME AND EDUCATION OF ADOPTED CHILDREN

Years of Schooling	Rental Value of Home per Month, Dollars							
	15	20	25	30	35	40	45	50
18	.....	.....	.....	.....	1	.....	.....	.....
17	.....	.....	.....	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	1	2	.....	1
15	.....	.....	.....	1	.....	.....	.....	1
14	.....	.....	.....	.....	1	.....	.....	.....
13	.....	.....	.....	2	.....	.....	.....	.....
12	.....	1	1	.....	1	.....	1	.....
11	.....	1	2	1	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	1	.....	.....
9	2	.....	1	.....	.....	1	.....	1
8	2	.....	.....	.....	.....	.....	.....	.....
7	.....	1	.....	.....	.....	.....	.....	.....
6	2	.....	.....	.....	.....	.....	.....	.....

$r = 0.60 \pm 0.08$
$n = 29$

Family index and education of adopted children.—The family index was calculated by the same method that was used in Part IV. The resulting relationship is a combination of the three preceding ones. This device gave a coefficient of correlation of 0.54±0.09 (Table LXXXVIII) between family index and education of adopted children.

TABLE LXXXVIII

CORRELATION BETWEEN FAMILY INDEX AND EDUCATION OF ADOPTED CHILDREN

Years of Schooling	Family Index in Hundreds																		
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	43
18	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...	...	1
15	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...
14	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
12	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	...	...
11	...	...	...	1	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
9	1	...	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...
8	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...

$r = 0.54 \pm 0.09$

$n = 29$

Financial status of home and education of adopted children.—These families were divided into three groups according to the estimates of financial status given by those who gave the other information. The three groups were average, between average and well-to-do, and well-to-do. These groupings are only approximations, but the resulting relationship proved to be unusually high, being 0.76±0.05 (Table LXXXIX).

Social viewpoint of foster-homes.—In one respect all these homes were alike. The parents had a yearning for children which was not satisfied by offspring of their own and which led them to feel a responsibility when they adopted a child. They desired to do the best they could for this child, and, since education is recognized as the clearest expression of opportunity, they gave the child, in most cases, as much as they could. In a few cases, however, the children took matters into their own hands

and terminated their schooling before their parents wished it to end. It is possible, also, that the poor native ability of the child was the cause of one early elimination. The writer is quite certain that one child—one of the seven who were not considered because they were children of

TABLE LXXXIX

CORRELATION BETWEEN FINANCIAL STATUS OF HOME AND EDUCATION OF ADOPTED CHILDREN

Years of Schooling	Rank of Financial Status		
	B	A–B	A
18			1
17			
16			4
15		1	1
14			1
13			3
12	1	1	2
11		2	2
10		1	
9	4		1
8	2		
7	1		
6	2		

$r = 0.76 \pm 0.05$

$n = 30$

relatives—reached its upper educable limit with the first year of high school. But all things considered, it is probable that a common social standard made these homes strive to educate the children under their care to as great a degree as the nature of the child and their own resources permitted.

SUMMARY AND CONCLUSIONS

These adopted children were born in homes where the parents were very poor, as a class, and the children were dependent, or about to become so, at the time they were taken into the foster-homes.

Most of them were taken into the foster-homes at an early age. None was older than twelve when taken into the foster-home.

They were adopted into homes which in most cases gave them superior opportunities.

They received a superior education as a class. One-half received a high-school education or better, and 22 of the 29 received more education than the average education of their foster-parents.

The coefficients of correlation presented are summed up in Table XC.

TABLE XC

Schooling of foster-parents correlated with schooling of adopted children	0.32±0.11
Number of books in home correlated with schooling of adopted children	0.42±0.10
Rental value of home correlated with schooling of adopted children	0.60±0.08
Family index correlated with schooling of adopted children	0.54±0.09
Financial status correlated with schooling of adopted children	0.76±0.05

It is probable that environment determined the amounts of schooling which 29 out of the 30 children received. It is possible that the environment, and not poor native ability, was responsible for the early elimination of the thirtieth.

The schooling of adopted children was closely correlated with the conditions, especially financial, of the homes into which they were adopted. This certainly suggests that environment exerts a pronounced, if not a determining, influence on the number of years of schooling which children receive.

Adopted children received as good an education, on the average, as the children of town-dwelling parents studied in Part III. Their foster-homes were very similar, in economic, social, and educational characteristics, to the city homes of this high-school group. In comparison with the children of Part IV—children from average Urbana homes—adopted children received over three years more schooling.

PART VI

GENERAL SUMMARY AND CONCLUSIONS

Numerous coefficients of correlation of varying degrees of reliability have been presented in the various sections of the study. These may be summarized, grouped according to the sources of the data, as shown in Table XCI.

These facts, and others which cannot be so readily summarized, when taken as a whole, point to a number of general conclusions. Other generalizations of a more specific nature are supported by facts presented here and there throughout the study. In addition, there are a number of inferences and suggestions which seem to the writer to follow logically from a consideration of the data, although it cannot be said that they are proved conclusively. The interpretations will therefore be divided into three groups, general conclusions, specific conclusions, and inferences and suggestions.

GENERAL CONCLUSIONS

1. The most important conclusion, supported by the study as a whole, is that there is a close relationship between the advantages of a home, its educational, economic, and social stations, and the number of years of schooling which its children receive. This conclusion is supported by the pioneer study made in Decatur; by the facts gathered from the high-school pupils of Centralia, Champaign, Gibson City, and Rochelle; by the information secured through the personal canvass made in Urbana; and by the results of the study of adopted children.

It might be worth while to discuss here the differences between these various parts of the study. The coefficients of correlation for the high-school group, Part III, are lower than those for the group which contains representatives of all classes, Part IV; while the group of adopted children, Part V, gives indications of a combination of the characteristics of both the other groups. This is not surprising when the groups are examined more closely. The high-school homes, Part III, contain the upper economic, educational, and social levels of the communities studied. This has resulted in the selection of those families which have favored a high-school education for their children. The less exact nature of the data furnished by the high-school pupils also tends to reduce the

TABLE XCI

Correlations from High-School Data	Schooling of Sons	Schooling of Daughters
Schooling of parents	0.45±0.03	0.42±0.03
Schooling of farm parents	0.35±0.03	0.47±0.07
Schooling of town parents	0.30±0.04	0.35±0.04
Schooling of father	0.44±0.03	.....
Schooling of mother	.....	0.43±0.03
Rental values	0.40±0.04	0.24±0.04
Number of books in homes	0.39±0.04	0.18±0.04

Correlations from Urbana Data	Schooling of Sons	Schooling of Daughters
Schooling of father	0.47±0.03	0.56±0.03
Schooling of mother	0.55±0.03	0.60±0.03
Schooling of parents	0.65±0.03	0.62±0.03
Schooling of better-educated parent	0.60±0.03	.....
Schooling of more poorly educated parent	0.57±0.03	.....
Rental values of home	0.63±0.03	0.64±0.03
Personal property assessment	0.47±0.04	0.52±0.04
Real estate assessment	0.63±0.04	0.58±0.04
Number of books in home	0.67±0.03	0.68±0.03
Number of rooms per individual	0.50±0.03	0.48±0.03

Schooling of father correlated with schooling of mother	0.65±0.03
Schooling of parents correlated with progress of sons	0.37±0.07
Schooling of parents correlated with progress of daughters	0.22±0.06
Number of books in home correlated with schooling of father	0.60±0.03
Number of books in home correlated with schooling of mother	0.61±0.03

Correlations with Size of Family	
Number of books in home	−0.10±0.04
Rental values	−0.10±0.04
Schooling of parents	−0.20±0.04
Schooling of children—	
Uncorrected	−0.20±0.04
Corrected for schooling of parent	−0.06±0.05
Schooling of sons correlated with family index	0.73±0.02
Schooling of daughters correlated with family index	0.73±0.02

Correlations with Schooling of Adopted Children	
Schooling of foster-parents	0.32±0.11
Number of books in home	0.42±0.10
Rental values	0.60±0.08
Family index	0.54±0.09
Financial status	0.76±0.05

correlation coefficients for Part III. The correlations of Part IV, which contains the general sampling from Urbana, are less influenced by the variations in families, because more varied economic, educational, and social levels of the community were studied. The data are also more nearly accurate. The education of the foster-parents of the adopted children resembles in amount that of the parents of the high-school group. The especial importance of the economic factor, however, as a cause for the adoption of children is revealed in the high coefficient of correlation found in Part V between rent, or financial status, and education. This phase resembles the general selection of Part IV. As a whole there is a substantial agreement between the various classes of data. All point in the same direction.

2. Another conclusion, supported by various sections in particular and by the combined data in general, is that environmental influences more often caused a child to stop attending school than did lack of ability to do the work. This conclusion is supported especially by the study of adopted children. Some of the environmental influences were within the school, such as, perhaps, certain subject requirements, unsympathetic teachers, and arbitrary regulations. Others were outside the school and characteristic of the community or the family. These influences operated frequently in producing a dislike for school. They caused the pupil to get into that state of mind which is usually described by saying that he "has lost interest in school work." This condition is not necessarily an indication that the pupil lacks the ability to do the work he dislikes. It may mean that he is unfitted by native endowment to attain more than average success in this particular kind of work, but it does not necessarily mean that he could not do even better than the average in something else. Or, it may mean that respect for education is not among the family traditions under which he has been nurtured.

It has been suggested, by some who give large stress to the factor of heredity, that the environmental factors measured here are merely an objective expression—a resultant—of the heredity of these homes; and that an even higher correlation would be found between the general intellectual ability of the parents and the amount of schooling their children receive. It seems to the writer that the facts brought out in the part devoted to adopted children suggest the improbability of such an outcome.

However, the writer will suggest how such an investigation might be attempted. In Urbana the social facts have already been secured and

the investigation might well be continued there. One could visit the families that furnished the information for Part IV of this study. These parents could be tested. The tests, to answer the purpose in a practical way, must be simple in application, as training on the part of the subject should not be presupposed. The results of the tests, when correlated with the amounts of schooling which the children received, would show how important the factors of heredity are, or, at least, whether heredity is as important as environment in determining the amounts of schooling the children receive. That there is a positive correlation between native ability and amounts of schooling received is doubtless true, but it is probably lower than is usually supposed. Such an investigation could be conducted just as well in another town as in Urbana, but it would then be necessary to secure the social data as well as the facts of heredity. A reliable comparison could not be made if one set of facts were taken from one town and another set from a different one, for there might be differences in the social composition which would vitiate the results.

3. Another conclusion which is almost a corollary of the two preceding is that early elimination is correlated with, and largely due to, factors outside the school. The school is only an institution of society. Society has created it and uses it as needs arise. Those who unreservedly blame the public school for elimination forget that the school imparts instruction to the children alone. Their parents were educated a generation earlier and can seldom be reached by the present-day school.

4. Since the amounts of schooling which children receive are closely correlated with the advantages of the homes from which they come, it follows that our high schools are largely attended and probably dominated during the last two or three years by pupils from homes of culture and of a reasonable measure of economic advantage. The well-to-do business and land-owning classes send their children, but the children of the laborer and artisan seldom graduate. This means, then, that the majority of our high-school graduates is furnished by a minority of the population. It also suggests something of the home type of those who attend our colleges and universities.[1]

[1] The large proportionate increase in high-school enrolment revealed by statistics from the reports of the United States Commissioner of Education shows that these homes have been availing themselves of the opportunity for education to a greater degree each decade. Not only have more children enrolled in the public high school, but Mr. W. S. Miller has shown that they stay longer than they did twenty-five years ago. (Mr. W. S. Miller's statistics are given in the *Illinois Teacher*, April, 1915, p. 7, and in *School and Home Education*, April, 1915, p. 282.)

5. If a person wished to forecast, from a single objective measure, the probable educational opportunities which the children of a home have, the best measure would be the number of books in the home. The highest single correlation was shown by this index. Further, it is an index which is easy to apply. It is probable, however, that a detailed analysis of the kinds of books found, the number bought each year, and the number and kind read by each member of the family would be a better criterion, though it would be more difficult to secure such facts. On the other hand, the increased patronage of public libraries, characteristic of some cities, may alter conditions somewhat.

SPECIFIC CONCLUSIONS

1. There are a number of minor points which may be made the basis for specific conclusions. The correlation between the schooling of the father and that of the mother is one of these. This fact, which seems to indicate that men and women of approximately the same educational level tend to intermarry more often than mere chance or even propinquity would suggest, might be called "educational selection." This is a very important point when it is considered that it results in the concentrated transmission from one generation to the next of certain social characteristics which vary with the types of homes represented. It means that there is a continuity, and perhaps at times an intensification through generations, of the tastes, prejudices, traditions, ideals, and standards which make up the social life of a home. Family traditions and ideals are thus continuous although the different members of a home come and go; the individuals separate and form new homes, but these are much like the old home in social characteristics, and especially in educational and cultural standards.

2. The relationship which holds true between the schooling of parents and the schooling of their children who are no longer in school is paralleled by a similar relationship for those children who are yet in school. Retardation was most frequent among those children who came from poorly educated parents. This implies that retardation is due to causes outside the school similar to those which were responsible for elimination, and over which the school has little or no control. Hence it is possible that retardation is only indirectly responsible for elimination.

3. Truancy on the part of children is correlated, as a rule, with ignorance on the part of parents. In those cases where truancy occurred in the better homes, it was not followed by early elimination. This emphasizes the importance of the rigid enforcement of compulsory attendance laws. The people who most frequently violate them are usually those who have had a limited education or none at all and hence cannot appreciate its values. Their children must be protected from this parental ignorance, and the cumulative growth of a tradition of schooling must thus be insured.

4. The conclusion that size of family alone seems to have no marked effect on the education of the children may be due to the fact that these homes (the homes studied in Part IV) are nearly all far above the poverty line. The addition of one or two children would probably not affect the standard of living much, although most of the families are small and such an addition would make a relatively great difference in each one's proportion of the home's resources. Another possible explanation is that this factor is counterbalanced by the operation of compulsory attendance laws which force the children of poorly educated parents—most of the large families were found in such homes—to go to school much longer than their parents did.

5. The table giving the relationship between size of family and education of the parents reveals the fact that the population of Urbana is not quantitatively reproducing itself.[1] Those parents who have attended only the elementary school have families which are barely large enough, on the average, to maintain the population. The better-educated families have only half enough children to do so. As a whole the population is slightly declining in numbers, except as it is increased through immigration. Further, it is being reproduced largely from the lower levels. As each level tends to reproduce its own kind socially, these facts have sociological importance. They indicate a condition which would be especially disconcerting if low social position were entirely due to inferior heredity and if there were no people of superior native ability in the untrained masses. Fortunately, there seems to be much ability in the masses which needs merely the opportunity to be trained to enable

[1] It has been shown by investigation that, in any community, all families which have children must average four each to maintain an undiminished population. In Urbana the average family contains 3.62 children; see W. E. Kellicott, *The Social Direction of Human Evolution* (New York: D. Appleton & Co., 1913), p. 114.

its possessors to take the place of our present leaders.[1] This is happening, for the masses are being elevated educationally, as is shown by the fact that children in general receive more education than their parents. This condition is especially true of the poorly educated, for with them compulsory education brings this about in a marked way. It is conceivable, however, that, as centuries elapse, this constant reproduction of society from the bottom will result in a greater tendency to mediocrity in general. If society's best are continually selected by conditions which do not allow them to reproduce their share of offspring, a time may come when the best will have nearly all disappeared. This condition is to be found in some of the backward towns of New England where emigration has removed the best and left the dregs. Spain gave her best to the New World for centuries and her present inferior position is often said to be the result of this. Such a degeneration will not necessarily result in a cessation of progress by society in general, but it will result in lessening the proportion of those of superior talent. Even if exceptional ability is the result of a happy combination of parental characteristics which may occur among the masses, the low birth-rate among the well-to-do results in a distinct loss through the gradual lapse of the family traditions, ideals, and standards.

6. The education of fathers and mothers is closely correlated with the number of books in the home. In other words, the size of the home library is a measure of the dynamic effect of education. It is probable that the same relationships can be detected in the number and kind of magazines taken, the number and character of plays and entertainments attended, and other intellectual or social avocations, diversions, and recreations.

[1] It must be remembered that the facts which support this conclusion have reference merely to the amount of schooling which children receive. They can be applied to other points only in so far as the situations are analogous. The following quotation from the writings of one of the most prominent sociological writers of recent years bears upon this point: "The proposition that the lower classes of society are the intellectual equals of the upper classes will probably shock most minds. . . . . Yet I do not hesitate to maintain and defend it as an abstract proposition. But, of course, we must understand what is meant by intellectual equality. I have taken pains to show that the difference in the intelligence of the two classes is immense. What I insist upon is that this difference in intelligence is not due to any difference in intellect. It is due entirely to difference in mental equipment."—Lester F. Ward, *Applied Sociology* (Boston: Ginn & Co., 1906) p. 91.

INFERENCES AND SUGGESTIONS

There are many points which were suggested by the data and by general impressions which were of such a nature that they could not be readily reduced to statistical facts. Others can be inferred from the study, although the figures do not prove them conclusively. A few of these inferences and suggestions follow:

1. One point which is suggested by the close correlation between the education of parents and home conditions, but which does not lend itself to statistical demonstration, is that the amount of education of the parents is the most important and persistent factor influencing the schooling of the children. Within certain limits it determines the occupation of the family breadwinner and restricts the earning power in any particular occupation. In a broad way, it forecasts the reading tastes of the parents, though the number of books in a home may be dependent more upon ability to buy than upon ability to enjoy.

2. Closely related to the preceding point is a more subtle and intangible outcome which may be called appreciation of the values of an education. This term describes the attitude of mind in which a person decides whether further schooling is worth the cost of obtaining it—cost being considered to mean the postponement of the satisfaction of social and other wants as well as economic loss. This appreciation of values serves as an impelling guide to both children and parents. For the child the values must be rather immediate to induce him to stay in school, while parents, with a longer life behind them, can appreciate remoter advantages. With the better-educated parents their own experiences with an education make them see that it was worth while to undergo the restraints and discomforts necessary to secure it because it made much pleasure possible. But the mere factor of custom or tradition is probably stronger than this reasoned conclusion.

It is probable that children frequently do not appreciate the values of an education, but their parents do. The children then attend school because of parental pressure. This was clearly illustrated by some of the truancy cases.[1] On the other hand, the child may think an education is worth while even though his parents do not, but this does not seem to be usual. In this case he may continue his education even in the face of discouragements. When both parents and child do not appreciate

[1] The three boys who played truant but came from the better homes were all in school or college when the data were gathered.

the values of an education, school attendance will probably be continued only so long as society's appreciation, as expressed in compulsory attendance laws, is operative. Similarly, neighborhood and community appreciation of the values of school attendance may coerce the family and shorten or lengthen the schooling of children. This is especially true when this appreciation reaches the stage where it becomes the "fashion" to do a thing.

These "values" may be purely economic. Education may stand for nothing more than increased earning power. It is probable that children who have given little thought to the future are less influenced by a possible economic advantage than are their parents. A dollar looks powerful to the child who never has had the privilege of spending any, and the allurements of the poorly paid "blind-alley" job are strong. Often the child does not realize that his future earning power would be greatly increased by a few more years in school. Parents themselves do not always realize it. Further, there are individual cases where more than a limited amount of schooling is almost a waste of time because of the lack of ability of those receiving it. Since the average parent reasons from the exception more often than from the rule, these exceptions stand out and have resulted in the popular notion, prevalent on certain social levels, that it does not "pay" to go to school. The better-educated parents are more likely to see the economic value of a good education and to compel the child to attend school.

In other cases attendance at school is favored because of the social prestige which is often the lot of those who attend high school and college. This "value" is probably more often the guiding motive with girls than with boys. It is especially in evidence in the choice of certain girls' schools by parents. This is a remoter end which probably influences the parents more than the children. A similar factor is at work with the children where the school life, especially in the high school, is connected with so many social pleasures—parties, athletic contests, clubs, and fraternities—so that as a result it is far more enjoyable than the life outside the school. This "value" is immediate and influences the children more than it influences the parents.

Another "value" is the purely intellectual pleasure which some pupils derive from their school work, the satisfaction of the "thirst for knowledge." There is no doubt that this is a very strong motive with certain pupils natively endowed with minds well fitted for intellectual work.

These various "values," economic, social, and intellectual, are not independent in their operation. They are nearly always combined, though one may predominate with one individual and a different one with another. They are, however, largely beyond the control of the public school as it has been operated in the past, and will probably remain so in the future. When values are not recognized by the children, their schooling will stop unless pressure from others—parents, friends, or community—prevents.

The foregoing discussion may be summarized by saying that parents seldom feel the need, and frequently do not recognize the advantage, of much more schooling than they themselves received. When the children have reached a realm of knowledge of which the parents are ignorant, they (the parents) often remark in substance: "Johnny has a better education than we ever received. We have made a good living. He ought to be able to do the same. Let him go to work now." This is especially true of homes where the parents have had little schooling and where "a good living" means little more than the bare necessities of life. This attitude is frequent where the parents are poor and can be assisted somewhat if the children contribute a few dollars to the family income.

3. Growing out of this appreciation of values when handed down through several generations is what may be called a *family tradition of schooling*. Appreciation reaches a stage where it is no longer rational but is a "prejudice." In such a home a child is almost as certain to attend school, if he keeps his health, as day is certain to follow night. The tradition often centers around some particular school or even a particular curriculum. Every child must follow the same path. Older brothers and sisters help the movement along and send the younger ones. On the other hand, it is probable that there are families in which the opposite is true. To them education is the mark of a despised upper class and they and theirs will have none of it.[1]

4. The fact that the economic station of a home is somewhat closely correlated with the schooling of the children might lead one to think that

[1] The tradition of schooling may be cumulative in its effect. The children of one generation may be kept in school by compulsory attendance legislation. When they rear families, however, they may desire their children to have a better education than they themselves received. This will lead to a gradual cumulative increase of family traditions of schooling. Compulsory attendance laws have been adequately enforced for such a brief period of time in most communities that we must wait for the growth of the next generation before accurate information can be obtained on this point.

low economic status was primarily responsible for much early elimination. The close interrelations of the various factors, as well as other data presented, show that this is probably not true. Indirectly, however, it is probable that lack of economic resources plays an important rôle, especially in bringing about elimination from the high school, where social stratification begins to manifest itself. A sensitive adolescent, from a home which could not furnish him with a clean linen collar every day, the newest cut in coat and trousers, and other marks of a well-to-do class, might prefer to leave school and go to work, in spite of all the wishes of his parents to the contrary, rather than face the jibes and slights of his schoolmates. Similarly, in poor homes, if the child is large enough to earn a little money, this is sufficient reason for him to leave school and contribute to the family income, although it might not be a great hardship for the parents to keep him in school a year or two longer. The fact that the girls averaged a year more schooling than the boys may be a reflection of the low earning power of an adolescent girl, which is much less than that of an adolescent boy.

5. Beginning with Ayres'[1] influential study of retardation and elimination there has been a disposition on the part of investigators to place the blame for the failure and elimination of pupils upon the organization and administration of the school, and especially upon the school program of studies. Such references can be found in a number of the important surveys.[2] It has become the fashion to ascribe the failure of the school

[1] Leonard P. Ayres, *Laggards in Our Schools* (published by the Russell Sage Foundation, New York, 1909). Dr. Ayres says: "Our courses of study as at present constituted are fitted not to the slow or to the average child but to the unusually bright one."

[2] Leonard P. Ayres, *A Survey of the Public Schools of Springfield, Illinois* (published by the Russell Sage Foundation, New York City, 1914). While discussing the "significance of progress records" the report says (p. 55): "Quite unconsciously the schools of this city, like those of many other cities, have developed a course of study, a system of examinations and promotions, and methods of teaching—in short an entire school system—better fitted for the needs and requirements of the girls than for those of the boys. Those conditions can be remedied and their alteration is one of the most important tasks which confronts the schools."

In the *Report of the Survey of the Public School System of School District No. 1, Multnomah County, Oregon, City of Portland, 1913*, in the section devoted to "needed reorganizations," Superintendent J. H. Francis says (p. 192): "The marked school death-rate in the seventh and eighth grades, to which Portland forms no exception (see Fig. 8, p. 150), can be accounted for by subject-matter in the course of study, methods of presentation, and general school conditions not congenial to early adolescence."

to these agencies. But in Urbana retardation and elimination were closely correlated with home conditions, factors over which the school has almost no control. How then can the public school be entirely to blame? Many of these children are social and industrial "misfits" as well as "misfits" in the public school. Some of them, undoubtedly, are mentally subnormal. These require individual or special treatment and profit little, as far as society is concerned, from their training. Many "misfits" are handicapped by home environments, will always be retarded, and will furnish the most of those eliminated early in the competition of life. Though the public school may be responsible for a few of these "misfits," many of them are due to social and other conditions outside of it. Unless the activities of the public school can be so extended as to control and direct the home and neighborhood life—something entirely beyond its proper sphere—slow progress and early elimination on the part of some are to be expected.

6. Because of the social factors involved, the differences between cities with respect to retardation and elimination may not be a measure of the relative efficiency of their school systems at all, but may be merely an indication of corresponding differences in the composition of the population of these cities.[1] A better measure of school and system efficiency might be furnished by the comparative improvement which has been made during a definite period. But such a comparison would have to include any changes in social conditions which may have taken place during that time.

7. For similar reasons curriculum changes, such as the "six-six plan" and the introduction of vocational work, cannot be expected to be unfailing panaceas for retardation and elimination.[2] Vocational work, appealing strongly, as it probably will, to the economic motives of parents and children, may lessen these evils somewhat, but it has its

[1] This point was made by E. L. Thorndike in his study, "The Elimination of Pupils from School" (Department of the Interior; Bureau of Education, *Bulletin No. 4*, 1907). Thorndike says (pp. 14–15): "In the opinion of the author, however, the character of the cities' population is more important than the character of their educational administrations as a cause of the variability of elimination."

[2] This point has been recognized by some of those who have investigated the problems of vocational education. Thus David S. Hill says: "We cannot find in industrial training a panacea for all of our social evils." (*Facts about the Public Schools of New Orleans in Relation to Vocation*, published by the Commission Council, New Orleans, June, 1914.)

limitations. The kinds of skills which can be imparted through the vocational work of any school or the schools of any one city are necessarily limited. Schools must confine their attention to the most general types of vocational training,[1] and many of these demand a preparation in the educational fundamentals as a foundation. Retardation and elimination frequently manifest themselves before these fundamentals are attained. Hence vocational education is greatly restricted in its possible sphere. The only way to insure the more adequate training of these children is to keep them in school longer through compulsory legislation. It may be expedient to offer vocational training to some of them, but vocational training should not be introduced into the public schools with the expectation that it will "interest" all such children and thus keep them all in school longer. Social forces doom it to failure if it is introduced with such an expectation.

8. The yearly influx of vast numbers of illiterate immigrants from southeastern Europe and western Asia is a phenomenon which may well be viewed with apprehension when considered in the light of the facts presented in this study. If these people were otherwise similar to the earlier immigrants in their social behavior, the absence of a tradition of schooling would be a serious thing. The probability of imparting such a prejudice to them under the conditions among which they live and work in this country is rather remote. From this standpoint a literacy test in our immigration laws might be of untold value. Studies of various foreign-born communities in the United States, conducted as this study has been, might furnish us with some very important facts which would aid in understanding the problems of assimilation.

9. All the arguments and facts thus far advanced which suggest that retardation and elimination are largely due to forces outside the public school do not justify teachers and school officials in neglecting any steps which will lessen retardation and elimination. These people should work just as faithfully as ever to adjust the schools to the needs of the state and of the local community. They have done much in the past

[1] The impossibility of providing vocational training where specific skills must be taught is obvious when it is recalled that 40 of the 98 parental occupations represented in this study might be classed as professions and skilled or semiskilled trades. None of the 40 is followed by as many as 7 per cent of the fathers, and most of the occupations have only one or two representatives. Only those skills which are common to a number of occupations can be taught, such as, perhaps, mechanical drawing and the reading of blueprints or commercial work.

and are wide awake to possibilities. These arguments and facts, however, may be a comfort to schoolmen who have been severely criticized by investigators because of the amount of retardation and elimination present in their communities after they have done their best to remedy defects.

10. Another point worthy of mention is the possible effect of the blind action of social pressure which keeps children in school who are so poorly endowed with native ability as to be unable to profit from the instruction. This has happened in the past and is still happening in many cases with the feeble-minded. They were given the same work as other children though unable to profit by it. In a similar way children probably are forced to attend the high school and even the college when not at all fitted for the work. They leave school unable to apply the education that they have had. Their failures furnish the stock arguments of the man in the street with respect to the uselessness of an education. However, no one has clearly demonstrated the existence of any considerable number of these failures. Although they make comparatively little use of the education they have received, they may be much better off with it than without it.

11. This study is, in all probability, qualitatively representative of conditions in the small cities and towns of Illinois and perhaps throughout the Middle West. It is probable that the problem may be complicated by other factors when the foreign-born part of the population of large cities is considered. In rural districts opportunity may play a much more significant rôle than in the cities studied. But it is probable that the better-educated and well-to-do classes will strive to educate their children although they may not always use the public school to attain their ends. Quantitatively, conditions are likely to vary from place to place and the quantitative facts given here must be restricted, when quoted, to the places from which they were secured.

FINAL SUMMARY

The results of the entire study may be summed up in the following points:

GENERAL CONCLUSIONS

1. There is a high correlation between the economic, educational, and social advantages of a home and the number of years of schooling which its children receive.

2. Environmental influences more often cause a child to stop attending school than lack of ability to do the work.

3. Early elimination is correlated with, and largely due to, social and hereditary factors outside the school over which the school has little or no control.

4. High schools are largely attended by the children from homes of culture and wealth, representatives of the "better class."

5. The number of books in a home is the best single objective index of the educational advantages open to the children.

SPECIFIC CONCLUSIONS

1. Men and women marry those who are of approximately the same educational level as themselves—"educational selection."

2. Retardation is greatest, as a rule, among the children of those parents who are most poorly educated.

3. Truancy is found most frequently among the children of poor and uneducated parents.

4. Size of family has no appreciable effect on persistence in school.

5. The population of Urbana, as far as birth-rate is concerned, is slightly declining in numbers, and most of the renewal comes from the less-educated half.

6. The number of books in a home is closely correlated with the schooling of the parents.

INFERENCES AND SUGGESTIONS

1. The education of the parents, as a rule, ultimately determines the educational advantages opened to the children.

2. Appreciation of the values of an education is probably lacking in the homes where the children are eliminated early from school.

3. A family tradition of schooling is probably very effective in inducing unusual persistence in school in some cases.

4. Low economic status is probably an important indirect factor in early elimination.

5. The popular notion, which places the responsibility upon the public school for the marked elimination which is commonly found, does not allow for the operation of powerful social factors outside the school, in comparison with which the influence of the public school is almost insignificant.

6. The amounts of retardation and elimination present in a school system are not necessarily measures of the efficiency of that system, for these phenomena may be due to the operation of factors outside the public school.

7. Curriculum changes cannot be expected to counteract some of the social forces which produce elimination.

8. The influx of large numbers of immigrants who have no family traditions of schooling is a phenomenon which may presage undesirable consequences.

9. Educators who have been blamed for inefficiency because of the retardation and elimination found in their schools can find facts presented here which show that investigators of school conditions have sometimes overlooked important social factors.

10. Social pressure sometimes keeps children in school who cannot profit by the work given.

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[1] A few pertinent references only are given.

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BY

AUBREY AUGUSTUS DOUGLASS
Clark University

Edited by GUY MONTROSE WHIPPLE, *Secretary*

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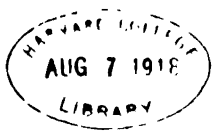

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EDITOR'S PREFACE

The growth of the Society's membership, together with the increase in the sales of its publications, has made it possible this year to expend a larger sum than usual in the preparation and publication of the *Yearbook*. For the first time in the history of the Society we are issuing the *Yearbook* in three parts.

It has always been the policy of the Society to devote its publications to the discussion of topics of the hour in the field of education. The junior high school is clearly one of the most timely topics at the present moment. Mr. Douglass, the author of this part of the *Fifteenth Yearbook*, has spent many months in collecting information upon his topic. In June, 1915, he printed in the *Pedagogical Seminary* a preliminary statement of his findings. Since that time he has secured much more extended information concerning the actual development of the movement in school systems, while the list of published articles dealing with the movement has been surprisingly lengthened. (Note the author's bibliography of 173 titles.) The present part of the *Fifteenth Yearbook*, accordingly, represents probably as comprehensive and as authoritative a statement of the junior-high-school movement as has thus far appeared in our literature. Those of our members who desire to familiarize themselves with the general problems involved in the movement will find the discussion in the main body of the text most useful, while those who are already directly concerned in the organization and supervision of junior high schools will find especially valuable the summary of the present status of the movement which is set forth in the Appendix.

G. M. W.

INTRODUCTION

This study was begun in the fall of 1914. It attempts to treat topics of pedagogical and psychological importance in junior-high-school organization, to give a general idea of the views of prominent educators as they have been interpreted, to present typical curricula and methods of organization, to give some conception of the development and present scope of the movement, and to cite sources of information for those who desire to make an extended study of the subject.

The basis of the work consists of material in the form of school reports and other special literature, questionnaire returns, and letters received from school superintendents, state superintendents, commissioners of education and collegiate institutions, and the literature dealing particularly with the junior high school. An attempt has been made, however, to reinforce and supplement this by considerable work in related fields of education.

School officers have been especially generous in response to requests for different forms of data and for special literature. The writer has been in touch with many of them during the entire period the investigation has been under way. He takes this opportunity to thank them for their interest and assistance. He expresses his indebtedness to Professor William H. Burnham for his advice in the preparation of the manuscript, and to Professor Charles Hughes Johnston, Professor Alexander J. Inglis, and especially to Professor Guy M. Whipple for suggestions and criticisms.

CHAPTER I

FEATURES OF READJUSTMENT

HISTORICAL SURVEY OF THE JUNIOR HIGH SCHOOL[1]

In the later eighties President Eliot took a position, which he has held since, that secondary education should 'dip down' to include the last two years of the elementary school. He seems to have been concerned primarily with the steadily increasing age of the average Harvard freshman, and to have looked upon this alteration in secondary education as a possible remedy for it. Other colleges were soon concerned with the same problem, and throughout the country attention came to be focused upon the educational system to determine what should be done.[2] This gave rise to the "Committee of Ten," in whose report it was pointed out that each one of the groups of experts that submitted reports upon the work of the high-school subjects was anxious that the work in its particular field should be begun earlier than was then customary.[3]

In another connection, the following extract is found in the report:

> In the opinion of the committee several subjects now reserved for the high schools, such as algebra, geometry, natural science, and foreign languages, should be begun earlier than now;; or as an alternative, the secondary school period should be made to begin two years earlier than at present, leaving six years instead of eight for the elementary-school period.[4]

In the deliberations of the "Committee of Fifteen" the question was raised whether the elementary course should be eight

---

[1]Bunker, F. F. Reorganization of the public school system. U. S. *Bureau of Educ. Bull.*, No. 8, 1916. 186 pp. (Gives an extended historical account of the junior high school with an inclusive bibliography.)

[2]*Ibid.*, pp. 44-47.

[3]Eliot, C. W. (chairman). *Report of the Committee on Secondary School Studies.* Washington Gov't Ptg. Office, 1893. 249 pp. p. 14.

[4]*Ibid.*, p. 45.

years and the secondary course four years; or whether each course should be six years.[5] An equal division of time was not recommended by the committee. From this time on, however, discussion of the question became more general. Dissatisfaction with the rigidity of the grade system and the conviction that time could be economized in education were productive of numerous plans of flexible promotions, which flourished during the decade beginning approximately with the year 1890, but which have persisted only to a limited extent. These plans did not solve the problem, for the agitation against the school system continued to gain momentum. Moreover, the personality of the originator of a plan seems to have been one necessary ingredient in its success; and the plans were pedagogically unsound in that on the one hand, they facilitated the progress of groups and not of individuals, while on the other hand they gave little attention to the program of studies as such.

During this period another plan to economize time was brought forward, which consisted in reducing the number of elementary grades. Kansas City, with its seven-grade elementary and four-year high school, is a well-known example of this latter plan, although schools may be found in many states with the same organization.[6]

Yet during the same period there were those who proposed to attack the problem from another angle, who insisted that the real solution lay in the division of the twelve years equally between elementary and secondary education. The essential difference between these two parties was that, whereas the one was desirous of destroying the rigidity of the grade system, thereby allowing more rapid progress over the same curriculum for groups of able students, the other would introduce high-school methods and subjects into the seventh and eighth grades and subjugate the existing curriculum to a process of condensation and elimination.

[5] *Report of the Committee of Fifteen on Elementary Education.* Published for the N. E. A. by the Amer. Book Co., 1895. 235 pp. p. 10.

[6] Greenwood, J. M. Shorter time in elementary school work. *Educ. Rev.*, 24: 1902, 375-390.

Solan, F. L. Shortening the years of elementary schooling. *Sch. Rev.*, 11: 1903, 4-17.

Butler, in 1898, argued for a "base-line from which to measure and lay out the educational course, in the nature of the child-mind and in the character of studies pursued rather than any merely formal and external scheme of administrative classification." Elementary education, for which he declared six years is sufficient, lasts from the age of six or seven to the period of adolescence, and gives general training in the elements of knowledge. Adolescence, which with us is normally from twelve to sixteen or from thirteen to seventeen, determines the period and nature of secondary education.[7]

An abundance of literature, dealing with all phases of elementary and high-school organization and curricula and including nearly all of the present-day arguments for or against the junior high school, appeared from 1900 to 1904. Three points of emphasis were noticeable. These have persisted, although they are at present less sharply differentiated. They were: Emphasis on the economy of time; emphasis on better mastery of subject matter; and emphasis on the reorganization of the curriculum. The first of these factors has probably been the most potent in bringing about the reorganization that is now national in its scope. In 1903 a committee was appointed in the N. E. A. to investigate the culture element and the economy of time in education. This committee did not report the next year, but in 1905 it recommended that reports be prepared which should consider whether the four years between the ages fourteen and eighteen, or the six years between the ages twelve and eighteen is the best period for secondary education.[8] Another committee, of which President Harper was chairman, was likewise appointed in 1903 and reported in 1905 at the eighteenth educational conference of the academies and high schools in relations with the University of Chicago. Nearly the same questions were proposed for consideration as by the N. E. A committee.[9] About the same time the Pettee committee formulated a schematic

[7] Butler, N. M. The scope and function of secondary education. *Educ. Rev.*, 16: 1898, 15-27.

[8] *Proc. N. E. A.*, 1905, p. 279.

[9] Harper, W. R. (Chairman). Report of the Commission of Twenty-one. *Sch. Rev.*, 13: 1905, 23-25.

program for a six-year high school;[10] and some time later the committee of the North Central Association was put to work.

In 1901, Dewey set forth the view that the educational system, which had developed a rather independent institutional existence, should be unified and brought into closer relation with existing social life. A readjustment was needed in the high school as the connecting link between the elementary school, which was created by a broad democratic movement, and the college, representative of a more aristocratic ideal.[11] Two years later he declared that the aim of the elementary school was not properly conceived, and that better results would be obtained if emphasis were transferred to the problem of mental attitude to be gained in the elementary school. According to his conception, the proper aim of elementary tuition should be to organize the instincts and impulses of children into working tools and interests. This ought to be accomplished in six years. "The elementary school would be relieved of its two chief wasting factors: on the one side, daily repetition of drill in rudiments which have been previously mastered; and upon the other, anticipations of subject matter so difficult that it can be pursued intelligently only at a later period." The high school, which begins at no definite point and ends at none, would then be able to formulate a definite task or aim of its own. The equal division of the twelve years between elementary education and secondary education would allow each to face its own particular problem.[12]

In 1903, Hanus and Snedden discussed aspects of the problem. In Hanus' opinion the function of the elementary school was to give a command of the school arts—reading, writing, and arithmetic—as well as some of the beginnings of general culture. He believed an extension of the time of secondary education would enable the public school pupil, as well as the private school pupil, to profit "by all the resources that the schools with good teaching and good equipment can offer him." He added that not all pupils in

[10]Quoted by P. H. Hanus. A six-year high-school program. *Educ. Rev.*, 25: 1903, 455-463.

[11]Dewey, J. Current problems in secondary education. *Sch. Rev.*, 10: 1902, 13-28.

[12]Dewey, J. Discussion: Shortening the years of elementary schooling. *Sch. Rev.*, 11: 1903, pp. 17-20.

the last two grammar grades should study languages or academic subjects, but rather that appropriate vocational training might be provided for many, and appropriate technical training at the upper end of all secondary or high schools.[13] Snedden came out clearly for diffentiated curricula beginning with the seventh grade. He argued that, although there were objections to early elections, these were necessary because there was doubt regarding the ultimate educational values of the subjects, because a large number of boys and girls stop school at an early age, and because of the possibilities of subsequent education. He urged early elections as the most satisfactory means of enlisting public sentiment and of adjusting educational work to the individual pupil, for then the "needs of the community would be met to a greater extent than is now the case, and certainly to a much greater extent than would be the case if secondary education studies should be prescribed for all pupils alike."[14]

Since 1900, the movement has rapidly gained headway. In 1905, Lyttle again advocated that the twelve-year course of study should be equally divided between the elementary school and the secondary school. He repeated the point stressed by Butler and Hanus that the elementary school should teach the rudiments of the common subjects, and advocated differentiation along three lines—business, mechanical arts, and professions.[15] In 1907, Morrison, as chairman of the N. E. A. committee, summed up the arguments for the junior high school,[16] and Hartwell found from his questionnaire study that the consensus of opinion was favorable to departmental study.[17] In 1908, Lyttle for the committee on six-year courses called attention to the fact that the six-three-three

[13]Hanus, P. H. A six-year high-school program. *Sch. Rev.*, 25: 1903, 455-463.

[14]Snedden, D. S. The six-year high school. *Educ. Rev.*, 26: 1903, 525-529.

[15]Lyttle, E. W. Should the twelve-year course of study be equally divided between the elementary school and the secondary school? *Proc. N. E. A.*, 1905, 428-433.

[16]Morrison, G. B. Report of the Committee on an Equal Division of the Twelve Years in the Public Schools between the District and High Schools. *Proc. N. E. A.*, 1907, pp. 705-710.

[17]Hartwell, C. S. Liberating lower education. *Sch. Rev.*, 15: 1907, 436-458; pp. 184-196.

division was being agitated in some places, and that at least ten cities had employed the six-six division and believed it to be more economical. He outlined a provisional curriculum for the last two elementary grades, according to which approximately seventy per cent. of the work of the seventh and eighth grades was required and the other thirty per cent. was elective, which is fairly representative of the junior-high-school curriculum today.[18] The next year the committee reported that the sentiment in favor of the proposed plan was growing and that twenty-two cities were organized.[19] In 1912, Francis outlined the work of the Los Angeles intermediate schools;[20] and in 1914 Kingsley asserted that the eight-four plan was rapidly growing obsolete.[21]

DEFINITION OF THE JUNIOR HIGH SCHOOL

Most definitions of the junior high school have been written from the standpoint of what the school should accomplish, and have been colored therefore by the views of their formulators. For one who has not studied the junior high school thoroughly it is extremely difficult to define briefly and clearly so variable and complex an institution as the junior high school; explanation and description are perhaps better than definition. A glance at some definitions will illustrate the point.

A definition which has received considerable attention is that of Briggs, who defined the junior high school for the purposes of his recent study as "an organization of grades seven and eight or seven to nine to provide by various means for individual differences, especially by an earlier introduction of prevocational work and of subjects usually taught in the high school."[22] For Davis, the essen-

[18]Lyttle, E. W. (Chairman). Report of the Committee on Six-Year Course of Study. *Proc. N. E. A.*, 1908, pp. 625-628.

[19]Morrison, C. P. Third report of the Committee on Six-Year Course of Study. *Proc. N. E. A.*, 1909, pp. 498-503.

[20]Francis, J. H. A reorganization of our school system. *Proc. N. E. A.*, 1912, pp. 368-376.

[21]Kingsley, C. D. Problem confronting the Commission on Reorganization of Secondary Education. *Proc. N. E. A.*, 1914, pp. 483-488.

[22]Briggs, T. H. Secondary education. *Rept. U. S. Commissioner Educ.*, 1914, Vol. 1, p. 137.

tial elements of a junior high school are a "rather complete reorganization of the subject matter to be taught, particularly within the seventh and eighth grades;" provision for differentiated curricula; provision for "some individual freedom of election of courses on the part of the pupils;" departmental teaching; and promotion by subject. Negatively, Davis asserts that the plan does not consist merely in segregating the pupils of these grades; nor in placing them with the high school; nor in departmentalization and promotion by subject; nor in having high-school teachers instruct seventh or eighth-grade classes.[23] Horn brings out practically the same negative points, adding that "if it is in reality an institution worthy of its place in our educational economy, it is an institution which is neither an elementary school nor a high school, but a provision for the needs of those children for which neither of the older institutions made suitable provision. It partakes to some extent of the nature of each, but is essentially different in character."[24]

Stetson defines the junior high school as a "definite constructive attempt to make the school serve the community by bridging the gap between the grammar grades and the high school by offering some form of pre-vocational work to those who can never attend high school, and through its ability to give them more vital and wider interests."[25] For Templeton, the essential thing is to secure a homogeneous school atmosphere which will be more conducive to effective work on the part of both pupils and teachers, and for which the segregation of grades seven, eight and nine are necessary.[26] To Tomlinson's mind, the "primary object of the junior high school is to give the pupils an opportunity to become familiar with secondary school organization, customs and manners two years earlier."[27] Hollister believes that, if real adjustment

[23]Davis, C. O. The subject-matter and administration of the six-three-three plan of secondary schools. *Univ. of Mich. Bull. No. 9*, 1915, pp. 8-9.

[24]Horn, P. W. The junior high school in Houston, Texas. *El. Sch. Jour.* 26: 1916, 91-95.

[25]Cited from *The Kentucky High School Quarterly*, July, 1915, p. 17.

[26]From a paper read before the High School Section of the Cal. Teach. Assn., Oakland, Dec. 30, 1913.

[27]Cited from *The Kentucky High School Quarterly*, July, 1915, p. 29.

is to be made, it must come "in the materials and processes of education with special reference to the changing conditions in the physical and mental characteristics of those to be educated. Here lies the fundamental fact to be considered first of all where any movement is undertaken for reform."[28]

The majority of the foregoing definitions stress the principle of individual differences more than any other; but a second vital principle is also brought out: namely, the reorganization of subject matter for the junior high school from a social standpoint, and its placement upon a sound pedagogical and psychological basis for instruction. At the present stage of development, it does not seem desirable to limit the junior high school to any particular group of grades.

Some cities have claimed to possess junior high schools and have been listed as possessing them when they have had only an arrangement for rapid progress of bright pupils. Other cities with the same arrangement have not claimed to possess junior high schools, although some have been listed as possessing them, at times contrary to their wishes. The arrangement in question has consisted essentially in giving able pupils an opportunity to take up certain high-school subjects—usually languages, algebra, or general science—before completing the eight grades. Accelerating this class of pupils is one means of providing for individual differences, but this feature of itself is only one of the many connected with the junior high school, whose advantages ought to be extended to every pupil, not to a favored few. If any line of demarcation is drawn, it would seem that cities that do not have a junior-high-school *system,* or that are not working toward such a system, ought not to be classed as possessing a junior high school. In this study, a city has been classed as having the junior high school if it claimed to have it.

The term "Junior High School" is most frequently used, with "Intermediate School" next in popularity. The terms mean precisely the same. "Junior High School" is employed nearly everywhere except in the states on the western coast, where "Inter-

[28]Hollister, H. A. *High-school and class management.* 1915, 314 pp. (p. 97).

mediate School" is preferred; although the latter term is used by a few superintendents throughout the middle west, New England, and the middle Atlantic states. "Junior School," "Grammar School," "Prevocational School," "Lower High School," "Consolidated School," etc., are also used in a few places as synonyms.

"Junior High School" seems to be a name that has arisen from the downward extension of the high school to include pupils who were younger. It denotes with fair accuracy the work included, and is decidedly popular with children. Its use is widespread probably because as a name it means more to school officials than "Intermediate School;" or that the name first gained foothold in the middle west and east. On the other hand, it is argued by some that this organization is not a high-school organization, nor does it resemble the elementary school, but rather is it intermediate between them, both as to methods and as to subject matter. State Superintendent Cary, of Wisconsin, gives as an additional reason for avoiding the term 'junior high school' that "one high school is enough in the minds of the people." [29]

ARGUMENTS FOR THE JUNIOR HIGH SCHOOL[30]

Current literature is replete with accusations brought against the eight-four method of grading. It is declared that our present method of grouping the grades is an historical accident, and is without pedagogical or psychological justification. Indeed, psychology demands a totally different system. The period between the ages of twelve and fifteen marks a time when the majority of children pass from the stage of childhood into that of youth, and this period of transition is accompanied by marked psychic changes.

[29] *Report of the Committee on the Reorganization of the Public School on a Six-Six Plan.* Issued by C. P. Cary, State Supt., Madison, Wis., 1914. 11 pp. (bibl.). (p. 4.)

[30] Hill, C. M. The junior high school. *Bull. of the Mo. State Normal,* Springfield, 1915. Vol. 10, No. 3, 48 pp. (Gives an excellent summary of the arguments for the junior high school.)

Johnston, C. H. Movement toward the reorganization of secondary education. *Educ. Ad. and Super.,* 1915. Published also in *Univ. of Ill. School of Educ. Bull. No. 13,* 1914, pp. 32-38. (Summarizes arguments for and against the junior high school.)

The Junior High School. Document No. 39, Council of Education, State of New Jersey, 31 pp. (bibl.). (Has reasons for and against the junior high school.)

Adolescence is a period of storm and stress, of changeableness, intense emotions, self-assertion, strong social attractions, and awakening to the significance of the industrial world and vocation. The adolescent begins to judge, inquire, reason, and he must have material upon which to exercise these powers. Our failure in the last two years of the elementary school has arisen out of our ignorance of the psychology of adolescence, for we have ignored its most salient points in arranging the curriculum, the teaching force, and the social activities of the school. For psychological reasons the study of foreign languages should be begun at the age of twelve, and such subjects as formal grammar and technical arithmetic should come later. There is also need of closer correlation between different subjects, such as history and geography. More important, individual differences in pupils call for at least a partial differentiation of courses to supply individual demands. But little vocational or prevocational training has been given, and the old organization has made it difficult to provide this training, which is properly begun at this age. Suitable work has not been provided for large or mature pupils, but they have been kept to their disadvantage in classes with smaller children.

Again, the old plan is positively wasteful: economically, for the time of the teachers has been taken up with small classes and equipment has not been used to its capacity; pedagogically,[31] for the aim up to this time has been to cover ground and to acquire information rather to develop attitudes and capacities, while the result has been a monotonous drill of elements previously mastered. An examination of seventh and eighth-grade curricula shows that about forty per cent. of the work is of questionable value, and about twelve per cent. of the time is spent in the study of grammar alone. Tests show that relatively little progress is made in these grades in the common branches,[32] while leading educators contend, and experimental evidence confirms the contention, that the tools

[31]Supt. Maxwell considers this phase of the question in his 1914 report, (pp. 120-123) and in his 1915 report (pp. 94-95). His first statement is criticised by C. H. Johnston in an editorial in *Educ. Ad. and Super.*, 1: 1915, 485-587.

[32]Hill, C. M. The junior high school. *Bull. of the Mo. State Normal*, Springfield, 1915, Vol. 10, No. 3, 48 pp. (pp. 26-29.)

of learning may be acquired in six years and that eight are not required. Moreover, the elementary school does not prepare for the high school, as is shown by the failure of half the pupils to enter the second high-school year; and it does not train for life, for there are endless criticisms made alike by its graduates and the business men employing them. Neither does it train for citizenship, nor for the industries. In short, the elementary curriculum leads nowhere.

The plan of providing one teacher for each grade is of value for the first six grades, but should not be continued through the next two years. For the proper development of the child's mind it is necessary that he now be brought into contact with a greater number of teachers, including more men teachers. To insure flexibility, pupils must be promoted by subjects. Departmental teaching will meet these problems in the most satisfactory way, while at the same time teachers who are specialists in their lines will be provided. In general, a type of teacher suited for this particular environment will be developed.

The whole school system will be more nearly unified by grouping together children of the same mental and physical development. The elementary school, the junior high school, or intermediate school, and the senior high school form homogeneous groups; and social activities and school organization can better be fitted to these groups. Under the old plan pupils of the junior-high-school age have been particularly unfortunate in these respects, for their development demands a more liberal treatment than can be afforded in the elementary school, while their experience and development are not sufficient to allow the freedom of the high school. Such a grouping will also allow each division of the school to concentrate more effectively upon its own particular part of the entire school curriculum.

The old plan is undemocratic, for democracy means equal opportunity, and heretofore attention has been given only to those that will go on in the school. Again, the lack of vitalized curriculum on the part of the seventh and eighth grades, the change in subjects, the sudden change to the departmental teaching in the high school, and the inability on the part of the pupil to study

independently are responsible for the gap between the eighth and tenth grades which less than half of the pupils are able to cross. Finally, the plan of having eight years in the elementary and four years in the high school finds no parallel in European countries.

ARGUMENTS AGAINST THE JUNIOR HIGH SCHOOL

The arguments against the junior high school are not receiving as much attention as those in its favor: In the first place the new plan will be more expensive, while the results desired may be attained through improving the present system. It has not been proved that there is necessary for psychological reasons such a radical change in school methods at this age as has been asserted. On the contrary, such evidence as we have shows that the transition from childhood through youth to manhood is a gradual rather than a saltatory process; and a scheme assuming the opposite will therefore fail for psychological reasons. Again, the advocates of the junior high school underestimate the importance of drill. "An enforced rate of intellectual progress, which may be contrary to the fundamental law of the child's rate of maturing, is not what is wanted." More work should not be attempted, but the work attempted should be done better than at present.[33] There is also grave danger that specialization will be carried to an extreme, or, in other words, that attention will be focussed upon the acquisition of technical skill rather than upon the educative value of the particular subjects. Furthermore, a democratic government is dependent upon the ability of its citizens to think, not only upon a high plane, but also upon a common plane. The former consideration means they must have sufficient and varied knowledge and experience, or elements of thought; the latter that these elements of thought must be largely the same to allow individuals to consider together the common problems of democracy. If this be true, there is a certain amount of knowledge which ought to be common to all, and which can be best given in undifferentiated curricula.[34]

[33] Sachs, J. *The American Secondary School.* 1912, 295 pp. (p. 112).

[34] Bagley, W. C. Principles justifying common elements in the school program. *Univ. of Ill. School of Educ. Bull. No. 13,* 1914, pp. 9-21.

The kind of teachers and principals demanded by the junior high school is not procurable. Moreover, the teachers and principals who have been employed in these grades in the elementary schools and who are not advanced to positions in the junior high schools will oppose the organization. Departmental teaching, also, has a number of serious defects. In the first place, a child of this age will find it difficult to adjust himself to so many different teachers, and he will be thrown entirely upon his own responsibility at a time when he needs the teacher's careful guidance. In the second place, teachers of one subject become narrowed; there is always a tendency on the part of some to overwork the pupils in their courses; and in general it is harder to place the responsibility of poor teaching.

Finally, small high schools with too few students to provide differentiated curricula will reorganize for the sole reason that it is being done elsewhere. In the more populous places, local conditions will largely determine the location of junior-high-school centers, and the convenience of the pupils who are to attend them must be taken into account. One or two instances have already been found where pupils attended a grade school rather than a more distant junior high school.

A more complicated organization, which the junior high school necessitates, will bring added difficulties in administration and discipline; and the possibility that the curriculum will deteriorate into a manipulation of courses as has been the case in the high school, but with more disastrous results. There may also be a tendency for the school system to divide into three distinct administrative units, with a "gap" between the sixth and seventh and between the ninth and tenth grades.

COST OF THE JUNIOR HIGH SCHOOL

Some of the advocates of the junior high school have maintained it would be less expensive than the old organization, and in support of this claim the figures of Superintendent Rundlett of Concord and the estimates of Professor Hanus, in the New York survey, have been cited again and again. At present, however, it is being frankly admitted that this organization is costing more.

Unless poorly prepared teachers are employed and a non-elective course of study given—where instruction will be for the class and not for the individual—it may well be expected this will be the case. At present it is estimated that the per capita expense will be midway between that of the elementary and of the high school.

From another standpoint, advantages have arisen. In the first place, junior-high-school pupils require less elaborate laboratories and shops, which, with a longer school day, can be utilized to their capacity. Secondly, in districts where more school buildings have been needed, schoolboards have adopted the policy of providing junior-high-school centers, transferring the seventh and eighth grades from the elementary schools and perhaps the ninth grades from the high schools, thus alleviating the crowded conditions in both instances. Sometimes, new junior high schools have been erected, in other cases old grammar-school or high-school buildings have been utilized, and new quarters provided for the elementary or the high-school pupils. The question of building accommodations has had great significance when the proposed change has been under consideration.

ECONOMY OF TIME AND THE JUNIOR HIGH SCHOOL

The fruits of the labors of the N. E. A. Committees on the Economy of Time in Education are set forth in the classical report submitted in 1913.[35] It has already been pointed out that, while it is difficult to single out one factor that has been most potent in bringing about the present-day reorganization of the entire educational system, the question of economy of time has been uppermost in the minds of the majority, at least until recently. The real junior-high-school movement of the present day aims to combine this element with a thorough overhauling of subject-matter, placing instruction on a firm and rational pedagogical basis.

Various committees and school officials that have worked upon the question of secondary educational organization in recent years have recommended plans essentially the same as the scheme pre-

[35] Baker, J. H. (Chairman). Economy of time in education. *U. S. Bur. of Educ. Bull. No. 38*, 1913, 106 pp. (bibl.).

sented by the Committee on the Economy of Time in Education. An improvement long sought in the American educational scheme is the establishment of a more connected and a more logical system, which shall at the same time provide the best training for those who drop out of school. Although the pauses in the proposed plan are to end a more or less definite period of training that is intended to fit well for life if withdrawal from school should occur, yet articulation as a whole is made more complete and the entire educational process is more nearly a unified whole. At the same time it is recognized that the avenue to higher accomplishment must always be kept open and transfer from one curriculum to the other must involve a minimum loss of time. It is hoped the reorganization of the seventh and eighth grades will contribute to the unification of the educational system in the following ways: By introducing into these grades some of the high-school subjects and by reserving some of the more difficult work of the elementary grades for the high school; by eliminating non-essential subject matter; by vitalizing instruction; by the gradual establishment of departmental teaching and consequent promotion by subject; and by closely articulating the work of these grades with that of the elementary school from below and of the high school from above.

Comparison has been made again and again between our system of schools and the systems of foreign countries, and the conclusion drawn that the American young man enters upon professional or graduate study on the average two years later than is necessary. Moreover, there are psychological reasons advanced in connection with this point. The period of greatest plasticity ends with the twenties; fourteen or fifteen is too late an age to begin the acquisition of the first foreign language or to begin commercial subjects, and twenty-two is too late to begin closer specialization, whether it be in apprentice work or in professional study. Entrance upon a profession should not be made at so late an age as twenty-seven. Under our system the age of keen interest is passed while the student is still in college, and the indifference that is a frequent ailment of college graduates is pointed to by many as a result of a course with no definite aim.

The provisional time scheme of the Committee on the Economy of Time is as follows:[36]

Elementary education, ages six to twelve.
Secondary education, ages twelve to eighteen.
College education, ages eighteen to twenty, or sixteen to twenty.
University education, ages twenty to twenty-four (graduate or professional school).

Superintendents and principals are already reporting a saving of time, especially in mathematics and languages and to a less extent in commercial work, general science and manual arts. Printed high-school courses of study frequently indicate how much high-school credit is accorded for a subject pursued below the ninth grade (see Table 1). Often, one-half credit is given. Thus, foreign language—which seems to lend itself more readily to the

TABLE 1

AMOUNT OF HIGH-SCHOOL CREDIT ALLOWED TO PUPILS OF THE LOS ANGELES INTERMEDIATE SCHOOLS[37]

SUBJECT	B7	A7	B8	A8	B9	A9
Algebra	.....	.....	½	½	1	.....
Ancient History	.....	.....	.....	.....	1	1
Bookkeeping	½	½	½	½	½	½
Commercial Arithmetic	.....	.....	.....	.....	1	1
Cookery	.....	.....	.....	.....	½	½
English	.....	.....	.....	.....	1	1
Freehand Drawing	.....	.....	¼	¼	½	½
French	½	½	½	½	1	1
Geometry	.....	.....	.....	.....	1	1
German	½	½	½	½	1	1
Latin	½	½	½	½	1	1
Mechanical Drawing	.....	.....	.....	.....	⅕	⅕
Music (Glee Club or Orchestra)	.....	.....	.....	.....	⅖	⅖
Oral English	.....	.....	.....	.....	⅕	⅕
Penmanship	.....	.....	.....	.....	¼	½
Physiography	.....	.....	.....	.....	1	1
Sewing	¼	¼	¼	¼	½	½
Spanish	½	½	½	½	1	1
Stenography	½	½	½	½	1	1
Woodwork	¼	¼	¼	¼	½	½

[36] *Ibid.*, p. 10.

[37] Superintendent's report, 1914, p. 137.
See also *Bull. of Univ. of Wis., No. 749*, Wis. H. S. Announcement, 1915-16, p. 18.

economy-of-time feature—studied through the seventh and eighth grades is counted as equivalent to one year in the high school. The principle of flexibility enables bright pupils to advance by subjects, with the result that in numerous cases pupils are one year ahead in some subject. It is perhaps correct to say that in a well-organized school capable pupils may readily complete the six years in five.

Besides the National Education Association and North Central Association committees now at work upon this problem, numerous city and state systems have appointed committees to systematize school work for their own localities. These reports, when submitted, will put the junior-high-school curriculum upon a more solid foundation as far as economy of time is concerned. Meanwhile, until further adjustment relative to the saving of time can be made, a number of institutions of higher learning are considering an arrangement whereby a student may begin special training in courses such as law, medicine, or engineering, in his junior college year. A majority would retain the Bachelor of Arts degree at its present standard, allowing, however, almost any consistent group, either professional or "cultural," to be elected the last two years.[38]

The years in which 159 schools were organized upon the junior-high-school basis, as given by our questionnaire returns (see Appendix, Section 3) are shown in Table 2.

TABLE 2

DATE OF ORGANIZATION OF 159 JUNIOR HIGH SCHOOLS

96	98	99	00	02	04	07	08	09	10	11	12	13	14	15	16
1	2	1	1	2	1	2	3	2	4	6	14	31	41	36	13

If the cities in this table are representative, the junior high school is a recent product, as far as actual organization is concerned. Correctly or not, the ones referred to as pioneers, from the standpoint of the present conception of the junior high school, are Columbus, Ohio (1909), Berkeley, Cal. (1910), Concord, N. H.

[38]Baker, J. H. (Chairman). Economy of time in education. *U. S. Bur. of Educ. Bull. No. 38*, 1913. p. 73.

(1910) and Los Angeles (1911). Crawfordsville, Ind. mentions 1907; Madison, Ind., 1908, and Ogden, Utah, 1909 as the year when their readjustment began.

However, in response to the agitation begun a number of years before, a number of cities had begun to work out plans which, if not designated as junior high schools, exhibited many features of the present organization. Thus, Superintendent T. A. Mott described in 1901 the working of the system in schools at Richmond, Ind., which had been reorganized in 1896. All the seventh and eighth grades in the city were collected in one building, and the work was done on the departmental plan. In a year and a half pupils did a strong high-school year's work in Latin or German. Such subjects as algebra, it was stated, seemed well fitted for eighth-grade children. Parents elected whether pupils should take Latin or German.[39]

Kalamazoo has had the seventh and eighth grades departmentalized for twenty-five years; Worcester and Providence have had provision for the rapid advance of capable pupils since 1898; Fresno, Cal., Muncie, Ind., and Fort Scott, Kan., have had the essentials of their present organization for a number of years.

PRESENT EXTENT OF THE MOVEMENT

The work of Commissioner Claxton is well known, as is that of the committees of the National Educational Association and the North Central Association, and certain leading universities and state departments. The Inland Empire Teachers' Association and the National Association of State Universities have been on record for some time as favoring the movement. At present, however, work is being undertaken that is still wider in scope. More state departments are preparing literature or courses of study for their schools; numerous state teachers' associations are discussing or approving the plan and are following their action by appointing

[39] Mott, T. A. Correlation of high-school and grammar-grade work. *Proc. N. E. A.*, 1901, pp. 287-288.

Bunker, F. F. Reorganization of the public school system. *U. S. Bur. of Educ. Bull. No. 8*, 1916. (Gives a number of examples of these early organizations.)

committees to work out courses of study; survey after survey has recommended the adoption of the junior high school or of some form of it, and almost every large city has special arrangements of some kind to investigate its own schools and to study what is being done elsewhere.

As a result of all this, the junior high school is in a stage of rapid development. In this investigation returns have been received from 41 states where it is in actual operation. In three of the remaining seven states agitation is beginning, while two others have types of high schools that their school officials deem better suited to local conditions than the junior high school would be. In California and in the states lying north of the Mason and Dixon line in the middle west are found the greatest number of junior high schools and the best organized curricula. New England, New York and Pennsylvania will doubtless see much change in this direction during the next two or three years, New Jersey is somewhat in advance while the southern states show the least development.

Returns have been received from 268 cities; of these, 189 have the junior high school more or less well organized, 20 are in the process of organization, 29 expect to adopt it later, 24 are studying the plan with a view to some mode of reorganization, and in 6 it has been recommended to the board of education. Reports consulted indicate that it is in operation in 97 additional cities, bringing the total up to 365. These schools are perhaps the most representative, but this number doubtless does not give the right conception of the present extent of the movement. If a complete canvass were made of all the cities in the United States, it would probably be found that the nation is pretty well committed to the plan of reorganizing its schools on a broad "junior-high-school" basis (see Appendix, Section 5).

CHAPTER II

PHYSIOLOGICAL AND PSYCHOLOGICAL CHARACTERISTICS OF ADOLESCENCE[1]

Whenever reasons are presented for the reorganization of the two upper grammer grades, we are pretty certain to find a statement to the effect that the boy or girl reaches the stage of adolescence at about the age of twelve, that certain physical and mental changes then occur, and that these changes should be recognized by a change in method of instruction. A careful examination of a large amount of literature dealing with arguments for the junior high school leads to the conclusion that in many places school officials are inclined to accept these arguments without careful consideration, and that this is especially true of the argument based on the physiology and psychology of the adolescent. Schoolmen appear to incline toward the opinion that, whereas we formerly thought that adolescence began at fourteen, we now think of it as beginning at twelve, and that we must therefore accord to the twelve-year-old the treatment formerly given to the pupil two years older.

DEFINITIONS[2]

The term adolescence is taken to denote the period of time beginning with puberty and ending with maturity, which is approximately from 14 to 25 in males and from 12 to 21 in females. Puberty is reached when the individual has acquired the development necessary to propagate his species, while pubescence is most frequently taken to indicate the stage of transition, or the time when the sexual organs are undergoing a noticeable change.

[1] *Adolescence* (1904, 2 vols.), by G. Stanley Hall, furnishes the basis for discussion of the psychology of the adolescent in this chapter. For a shorter work, see pages 246 to 312 in *Principles of Secondary Education* (edited by P. Monroe, 1914), written by G. M. Whipple.

[2] These definitions are adapted from Hall, Whipple, Crampton, and Baldwin.

According to the last definition, prepubescence would mean the period up to the time when pubescence begins, and postpubescence would mean the period of time following the completion of pubescence.

Chronological age is determined by the number of years, months, and days the individual has lived, and may or may not correspond to the physiological age, which is determined by the state of physical development and maturity that has been reached, as indicated by menstruation, change of voice, eruption of the beard, etc. Anatomical age is closely connected with physiological age, but has a stricter reference to structure, such as is indicated by the time of appearance of the six-year-molars, the wisdom tooth, or the epiphyses of the bones. Psychological age has reference to the degree of mental development attained, and is much more closely connected with physiological age than with chronological age. Pedagogical age denotes the school standing. To these is sometimes added a moral or religious age, which has reference to the moral or religious outlook, especially of the youth compared with that of the child.

THE GENERAL PHENOMENA OF ADOLESCENCE

The following quotations give a general view of the way different psychologists regard the mental and physical changes of adolescence. For the most part they agree in saying that mental and physical acceleration go together, but disagree in other particulars.

Adolescence is a new birth, for the higher and more completely human traits are now born. . . . . Development is less gradual and more saltatory . . . . . The annual rate of growth in height, weight, and strength is increased and often doubled, and even more. Important functions previously non-existent arise. Growth of parts and organs loses its former proportions, some permanently and some for a season. Some of these are still growing in old age and others are soon arrested and atrophy. The old moduli of dimensions become obsolete and old harmonies are broken. The range of individual differences and average errors in all physical measurements and all psychic tests increases. Some linger long in the childish stage and advance late or slowly, while others push on with a sudden outburst of impulsion to early maturity . . . . . Interest in adult life and in vocations develops. Youth awakens to a new world and understands neither it nor himself. The whole future of life depends on how

the new powers now given suddenly and in profusion are husbanded and directed. (G. S. Hall, Adolescence, vol. 1, pp. xiii-xiv.)

The change from an asexual to a sexual life may occur at any age from 6 to 20 years, usually between 12 and 15, but when it does occur the changes are profound. In the short space of six months the child becomes a man or a woman, and the process is fraught with the dangers and turmoil of a new birth. There is an outburst of physical growth, 4 to 5 inches are added to height, 30 to 40 pounds to weight, and strength may be doubled in a short space of time. New mental abilities appear, while others disappear, the type of play changes, new companions are sought, new likings, tendencies, enthusiasms, and emotions make up the whole life. Old landmarks of life fade and new ones are eagerly sought. . . . . The important fact that is constantly disregarded is the fact that the pubertal change leaves the child a wholly different being—different mentally, physically, morally, and ethically from the children in the state just left behind. (C. Ward Crampton. Int. Cong. on Hyg. and Demog., 1912. vol. 3, p. 228.)

It is probable that acceleration of body growth and mental growth go hand in hand, and not vice versa. (F. Boas, Cyc. of Ed. Vol. 3, pp 187-190.)

It is a favorite dictum of superficial psychology and pedagogy that instincts lie entirely dormant and then spring into full strength within a few weeks. At a certain stage, we are told, such and such a tendency has its 'nascent period' or ripening time * * * * The one instinct whose appearance seems most like a dramatic rushing upon life's stage—the sex instinct—is found upon careful study to be gradually maturing for years. The capacity for reasoning shows no signs by any tests as yet given of developing twice as much in any one year from five to twenty-five as in any other. In the cases where the differences between children of different ages may be taken roughly to measure the rate of inner growth of capacities, what data we have show nothing to justify the doctrine of sudden ripening in serial order * * * * Indeed every tendency that has been subjected to anything like rigid scrutiny seems to fit the word gradual rather than the word sudden in the rate of its maturing. (E. L. Thorndike, Educational Psychology. Vol. 1. pp. 260-3.)

However, the manifold alterations and augmentations in psychic life—the new instincts, feelings, ideals, motives, and the general ripening of intellectual grasp that make up the psychological picture of adolescence—point unmistakably to corresponding alterations in brain activity. These alterations may be in part the functional maturing of cells and tracts hitherto dormant, and in part the extension and ramification of the fiber processes of cells already mature, particularly in the 'higher' association areas of the cortex. The one development would account for the awakening of new instinctive tendencies, the other for the enriching and elaboration of mentality in general. (G. M. Whipple, in Principles of Secondary Education, p. 257.)

Two children fifteen years of age may vary from each other at least four years in their stages of physiological development—a fact which should be taken into consideration in all educational work, whether physical or mental. The results of the writer's previous study show that the stages of physical and mental maturity are parallel, irrespective of precocity or brightness; therefore, the obvious educational corollary is that our school systems, public and private, should take into careful consideration *the physiological age and the accompanying stages of mental maturity* of boys and girls, rather than the chronological age and brightness, as is now done. This would require that tall, healthy children of accelerated physiological development be encouraged to proceed through school as rapidly as possible within the limits of thoroughness, and that the small, light children of retarded physiological development be kept below or in the normal grade, doing supplementary work, *since these short, light pupils are immature in mental development, although in many cases precocious in degree of brightness.* (B. T. Baldwin. A measuring scale for physical growth and physiological age. Fifteenth Yearbook of this Society, 1916, p. 15.)

The problem of secondary education becomes one of determining more clearly the instincts or capacities peculiar to the adolescent, and the method of their treatment so that they may be productive of recognized values. Hall regards the sex instinct as the basis of the changes of this age, and many other traits as "long-circuitings" or "irradiations" of the sex instinct. Laying aside for the moment the question of the suddenness with which the tendencies appear, it will probably be admitted that the youth and the child differ markedly with respect to such traits as altruism, aesthetic appreciation, religious outlook, social relations, as well as the more primary sexual characteristics; and also in powers or capabilities such as are included in terms like 'reason.' Whipple points out that we do not need to assume that these instinctive responses to stimulations are wholly lacking up to the time of puberty, but that there is a biological basis for the belief that these types of feeling and behavior are intensified as the body assumes preparedness for the functions of race perpetuation.[3] This takes us immediately into a consideration of growth.

[3]Whipple, G. M. In *Principles of Secondary Education* (by P. Monroe, 1914), p. 272.

PHYSICAL ASPECTS OF ADOLESCENCE

Measurements show the rate of absolute growth to be greatest at the time of birth, decreasing rather rapidly until about the ninth year for girls and the eleventh year for boys. With adolescence comes a marked increase in the rate of growth, reaching a maximum for boys at about the age of fourteen and for girls about two years earlier. After this the rate of growth decreases rather rapidly until the approximate age of twenty for males and seventeen for females. There is a correlation in height, weight, and lung capacity, although the parts and organs of the body do not grow at an equal rate, but develop rather independently of each other. There is an extraordinary range of individual differences during the period of years in which boys and girls as a class reach adolescence; and a corresponding difference in anthropometric measurements. Boaz draws the conclusions that during school age individual differences may be measured by a probable variability of about 2.5 years; that individual differences in measurements and structural and functional traits are the greater, the more rapid the rate of development of growth; that measurements of children of the same age represent individuals of different physical developments; and that these differences are greater, the older the children.[4] Baldwin found that at the age of fifteen the heaviest boy in his group weighed 110 pounds more than the lightest boy; and the heaviest girl 104 pounds more than the lightest girl. At the age of 14 the tallest boy was 35 centimeters taller than the shortest boy and similar variations were found for girls.[5]

With the period of adolescent acceleration comes a great increase in the growth in bones and muscles. The change involves a lengthening, especially of long bones; a thickening, through the addition of new periosteal layers; a change in constitution and proportion, and an advance in the process of ossification. The muscles, which form 27.2 per cent of the weight of the body at the age of eight, grow proportionately more rapidly, so that at the age of sixteen they form, 44.2 per cent of the weight. Bones and muscles

[4] Boaz, F. Growth. *Cyc. of Educ.*, vol. 3, pp. 187-190.

[5] Baldwin, B. T. Physical growth and school progress. *U. S. Bur. of Educ. Bull. No. 10*, 1914. p. 16.

together form about 72 per cent of the weight of the adult, so their increase is the chief factor in growth. This general increase is most readily seen in the curves of height and weight.

This growth in the bony tissue and the increase in the relative percentage of the muscles, with other new bodily structures and probable changes in organs and functions, are accompanied by an extension of the circulatory system to meet these new demands. There is, however, another important change, in that the blood pressure is heightened. With the child the heart is relatively smaller and the arteries are relatively larger than with the adult, and hence the child's blood pressure is less. Burnham cites this to account for the fact that the child is able to endure violent physical activity for a short time only, while the adult is capable of more strenuous activity for a longer period; and it leads him to conclude that certain physical exercises such as long-distance running, should not be indulged in until the readjustment of the circulatory system is complete.[6]

At birth the relation of the heart to the arteries is as 25 to 20, at the beginning of puberty it is as 140 to 50, and in full maturity it is as 290 to 61. The capacity of the lungs increases noticeably during the period of adolescence, as is shown by chest measurements or by the spirometer. Measurements show that with girls the increase is most rapid from twelve to fourteen, and with boys from fourteen to sixteen. The rate of growth in both cases then decreases until the final capacity is reached at the approximate age of 20. There is also a period of strengthened vitality; a marked increase in strength; the voice changes; there are changes in facial expression; and an augmentation in the length and width of the skull. Boys lose a certain amount of fat and become lean looking; girls less frequently so. In boys the joints and points for muscular attachment are more prominent; in girls there is a marked development of the pelvis.

The brain grows little after the age of eight, and perhaps practically completes its growth at the age of fourteen. As has already been shown in a quotation, at this age may come a "functional

[6]Burnham, W. H. Unpublished Lectures, 1915-16.

maturing of tracts hitherto dormant," and perhaps an "extension and ramification of fiber processes already mature, particularly in the higher cortex." Burnham points out that the development of the nervous system is conditioned by that of the muscular system so that the development of the two go hand in hand.[7] According to Hall, this is the age when attention should be given to the development of the large muscles of the legs, arms, and trunk, while finer coordinations should be left until a period when muscular and nervous adjustment is more complete. Pedagogically, this means the attempt to develop "skill of hand and eye" through fine muscular coordinations is wrong at the beginning of adolescence, for at this age attention should be given to the development of the basal muscles. Sufficient correlation should exist between industrial arts courses and physical training to insure such development.[8]

PSYCHICAL ASPECTS OF ADOLESCENCE

Another aspect of adolescence possesses great importance: namely, the adolescent is mentally different from the preadolescent. Whipple says:

> Compared to the relatively self-centered life of the child, the life of the adolescent is shot through with consciousness of self as related to other persons. His outlook is hetero-centric, not ego-centric. His behavior has constantly a social reference. He considers himself in relation to others. It needs no argument to show how important these social tendencies are from every point of view.[9]

The actual manifestations of this social instinct are seen in a new tendency toward organization and association, and especially in what may be termed the outlook on the world in general. Reactions are less spontaneous, but factors in a situation are interpreted according to their wider significance. For instance, the teacher's direction is sufficient in the case of immature children for the preparation of a lesson or to determine discipline; these children do not

[7] Burnham, W. H. Manual training, hygiene of. *Cyc. of Educ.*, vol. 4, pp. 127-128.

[8] Hall, G. S., and Tanner, A. E. Adolescence. *Cyc. of Educ.*, vol. 1, pp. 29-44.

[9] Whipple, G. M. In *Principles of Secondary Education* (edited by P. Monroe, 1914), p. 273.

see the connection between what they are told to do and anything outside of the school room. On the other hand, the mature student wants to know the value of the school work and its connection with adult life and vocation; and he is disciplined more easily if he can see the justice of the rules he is asked to obey.[10] This accords with Hall's theory that the preadolescent years are most adapted to methods of drill; while with the adolescent, subjects are best presented in not too detailed a manner. Dewey believes a child first experiments to see what each step brings, and it is not until later—perhaps at the age of thirteen or fourteen—that he sees the larger connections of history or science.[11]

The view that mind and body are not independent of each other is perhaps responsible in part for the belief that important changes in mental capacities as well as physical characteristics occur during the adolescent age. Conclusions reached and correlations drawn by different writers have not been entirely in agreement, although perhaps the majority confirm this view. Certain physical characteristics, such as weight, height, strength, girth of chest, etc., permit of definite measurement. But the methods for ascertaining mental characteristics have been so varied, and the factors involved so complex, that often valid grounds have been found for objection to the results found and conclusions drawn. Moreover, agreement as to method in these investigations might not end the matter. It is frankly admitted that we know little about the development of the nervous system at this age, or the change in shape and size and chemical composition of the organs of the body. And it is likewise with the instincts. There are lists of instincts, but they differ one from another. It is generally agreed that instincts appear at different periods of life, but it is not agreed at what time they appear, whether some of them may appear suddenly or whether all of them appear gradually. At the present time mental tests have not been sufficiently developed to give us a precise and comprehensive knowledge of the mental traits of the adolescent as compared with

[10] *Fifteenth Annual report of superintendent: Physical training and hygiene, New York City.* p. 25.

[11] Dewey, J. The psychology of the elementary school curriculum. *The El. Sch. Record,* No. 9, 1900, pp. 221-232.

the preadolescent. Likewise, the various pedagogical scales we now have, are primarily measures of product and not of process, and may not be expected to bring out the intrinsic mental difference between the adolescent and the preadolescent. For instance, it might be expected that an arithmetic scale could indicate difference in adding ability (as denoted by the number of given reactions possible in a given time) between two pupils of the same age but of different degrees of maturity, but it can hardly be expected that the results of this test will tell much about the way in which each pupil connects his arithmetic with outside affairs.

TIME OF ONSET OF PUBERTY

Examination of tables proves that no very exact time can be taken for the advent of puberty. Observation shows it may occur any time between the ages of 12 and 17 in boys, and 11 and 16 in girls. A number of factors are operative in hastening or delaying this phenomenon. Children of one nationality or race may enter upon the period of pubescence earlier than those of another; and climate is also thought to be a determining factor. Studies made in Russia, Germany, England, and America demonstrate the fact that children from the so-called higher social strata mature earlier than children from the poorer classes. When pubescence is delayed the period of transition is shortened and with it the period of growth; and while in the latter case the rate of growth may be more rapid, it seems that total growth is not so great. Good hygienic conditions and health are favorable to growth and development. All growth curves show girls have their period of accelerated development about two years earlier than boys, and investigators agree girls mature about two years earlier. This is most important if the view is held that psychical changes are occurring at the same time. Children who are taller and heavier—both boys and girls—seem to mature at an earlier age than those who are not.

Fewer data are at hand for the observation of this physical stage in the case of girls. Marro[12] observed the onset of puberty in 261

[12]Table cited by Whipple, in *Principles of Secondary Education* p. 248.

girls, and his table shows the advent of this function may be as early as the tenth year and as late as the twenty-first year. Baldwin[13] records first menstruation as early as the eleventh year and as late as 16 years and 7 months.

Table 3, taken from Baldwin, indicates the appearance of pubescent changes in 1,241 girls.[14]

TABLE 3

RELATION OF PUBESCENCE TO AGE IN 1,241 GIRLS (BALDWIN)

Age	No. Prepubescent	Percentage	No. Pubescent	Percentage	No. Postpubescent	Percentage
6½–10	149	100	..	.....	...	.....
10½	45	93.75	3	6.25	...	.....
11	27	100	..	.....	...	.....
11½	41	78.84	10	19.23	1	1.92
12	18	62.06	11	37.93	...	.....
12½	39	58.20	16	23.88	12	17.91
13	17	39.53	15	34.88	11	25.58
13½	10	15.15	25	37.87	31	46.96
14	10	15.38	25	38.46	30	46.15
14½	3	44.88	11	17.74	48	77.42
15	...	.....	8	14.54	47	85.45
15½	1	1.55	5	7.81	58	90.62
16	1	2.04	3	6.12	45	91.83
16½	...	.....	2	3.17	61	96.83
17	...	.....	..	.....	43	100.00
17–21½	...	.....	..	.....	198	100.00
22+	1 (22 yrs.)	.60	..	.....	165	99.4

Table 4, taken from Crampton, shows the per cent of immature, or prepubescent; maturing, or pubescent; and mature, or postpubescent boys out of a total of 4,800.

TABLE 4

PERCENTAGE OF BOYS AT GIVEN STAGES OF PUBESCENCE (CRAMPTON)

Age	Prepubescent	Pubescent	Postpubescent
12.5–13.0	69	25	6
13.0–13.5	55	26	18
13.5–14.0	41	28	31
14.0–14.5	26	28	46
14.5–15.0	16	24	60
15.0–15.5	9	20	70
15.5–16.0	5	10	85
16.0–16.5	2	4	93
16.5–17.0	1	4	95
17.0–17.5	0	2	98
17.5–18.0	0	0	100

[13]Baldwin, B. T. Physical growth and school progress. U. S. *Bur. of Educ. Bull. No. 10*, 1914. p. 66.

[14]Baldwin, B. T. A measuring scale for physical growth and physiological age. *Fifteenth Yearbook* of this Society, 1916. Part 1, pp. 11-12.

As Crampton points out, this table demonstrates the fact that physiological and chronological age do not coincide. Also, "at characteristic ages, the mature are more than 33 per cent heavier, 10 per cent taller, and 33 per cent stronger than the immature."[15] Crampton says further:

> Each physiological age group contains individuals who vary much among themselves as to their real physiological age. For instance, the prepubescents are fifty-five per cent of the total number at the age of 13.25 years. Some of these, fourteen per cent of all that age, will become pubescent within a half year; others, one per cent of all, will not become pubescent until 16.75 years of age. This one per cent is, therefore, three years younger physiologically than the fourteen per cent. In a similar manner, the individuals in the postpubescent groups vary as to the number of years elapsed since they have passed through pubescence.[16]

CRITERIA FOR JUDGING ONSET OF MATURITY

Measurements of height, weight, strength and vital indices when compared with certain physiological changes, notably in the sex organs, have led certain investigators to the opinion that height, weight, strength, and vital indices may be taken as criteria for the onset of maturity. Foster, for instance, believes height alone may be used as a criterion for classification according to physiological age;[17] and Baldwin thinks height and weight appear to offer excellent objective standards for determining maturity for both boys and girls.[18] Crampton, who has done extensive work in this field, when classifying boys with whom it was inconvenient to employ the method of direct examination, used the following procedure:

> The boys formed a line and passed in review, each stating his age to the examiner. He was then given a number—one was most mature, five least. The following signs were noted: The voice (changed and low or unchanged

[15] Crampton, C. W. Anatomical or physiological age versus chronological age. *Ped. Sem.*, 15: 1908, 230-237.

[16] Crampton, C. W. Influence of physiological age on scholarship. *Psych. Clinic*, 1: 1907, 115-120.

[17] Foster, W. L. Physiological age as a basis of classification of pupils entering high schools. *Psych. Clinic*, 4: 1910, 83-88.

[18] Baldwin, B. T. Physical growth and school progress. *U. S. Bur. of Educ. Bull. No. 10*, 1914. 215 p. (bibl.). p. 67.

and high); the presence of the second molars; height and weight; the subcutaneous fat of the face and hands. In the immature the subcutaneous fat is more evident and adheres closely to the skin, which is of finer texture; in the mature the skin is firmer and thicker, less attached to subcutaneous tissues, which contain less fat. The prepubescent is chubby, the postpubescent may be fat, but there is an easily recognizable difference . . . . . The principal of the school, after witnessing the classification of three classes, designated the gradings for 20 boys, 18 of which were correct and 2 varied but one step.[19]

SCHOOL WORK AND PUBESCENCE

Porter, Baldwin, Christopher, and Smedley have concluded that large children are intellectually superior to small children; Gilbert found no evidence to warrant such a conclusion, while West and Foster found a negative correlation. After an examination of the basis for the conclusions of other investigators, Baldwin remarks that "the important conclusion here was long ago anticipated by Porter, but on account of the doubtful attitude of these other investigators toward his result, it has received little or no attention. He very wisely says, 'No child whose weight or height is below the average (median or norm) for its age should be permitted to enter a school grade beyond the average of its age except after such a physieal examination as shall make it probable that the child's strength is equal to the strain.' "[20]

Thus, the weight of later and more careful studies seems to confirm the conclusion that larger children—and hence those maturing earlier—are intellectually superior to smaller children. In the light of the correlation found between good scholarship and physical maturity, we may expect to find a large percentage of the mature pupils in the elementary grades inherently dull. A number of experiments have thrown light upon this problem.

Crampton's investigations lead him to the conclusion that there is a correlation between scholarship and pubescence. Thus, he found boys of a given age (14.75 years) in groups from the first to the fifth term in the high school. Of the boys in the first term, 57.1 per cent were mature, and of those in the fourth and

[19]Crampton, C. W. The significance of physiological age in education. *Int. Cong. on Hyg. and Demog.*, 3: 1912, 224-236.

[20]Baldwin, B. T. *loc. cit.*, p. 90.

fifth terms 83.3 per cent were mature. A consideration of the number of failures of boys within a certain age-group (13 years) showed 18 per cent of the mature failed of promotion, as compared with 27 per cent of those immature. Groups of boys aged 14 and 15, respectively, showed similar results. Considered on the basis of success in school, the class work of the immature was poorer than that of the mature, as fifty per cent more of the former than of the latter failed.[21]

The results of Baldwin's investigation agree in many particulars with Crampton's. His records show children of accelerated physiological development completing the last grade of the elementary school at the age of 12 years, 9 5-6 months, with an average of 84.35; and those of retarded physical development at the age of 13 years, 7- 3-4 months, with an average of 81.72. He concludes that if pedagogical age be accepted as a fair equivalent to mental development, "the tall, heavy boys and girls with good lung-capacity are older physiologically and further along in their stages toward mental maturity as evidenced by school progress than short, light boys and girls."[22]

Stewart studied the physical growth and school standing of 207 boys over a period of years. When he considered the individual curves and correlations, together with the size of the boy at 14 years of age and his stage of development, the indications were that the tall or heavy boys of early development ranked better than tall or heavy boys of late development, and that light boys of late development ranked better than light boys of early or medium development. "Boys of medium size or medium period of development are hard to classify, though a majority of them appear to be doing school work of medium rank."[22a]

An investigation was made in the New York City elementary schools to determine the quality of school work these average pupils were doing. In the fifth, sixth, and seventh grades pupils who

[21] Crampton, C. W. Influence of physiological age on scholarship. *Psych. Clinic*, 1: 1907, 115-120.

[22] Baldwin, B. W. *loc. cit.*, p. 96.

[22a] Stewart, S. F. A study of physical growth and school standing of boys. *Jour. of Educ. Psych.*, 7: 1916, 414-426.

were making poor marks were on the average 37, 40, and 46 per cent, respectively, more advanced than those doing satisfactory work. As a result of this investigation, it was recommended that "children who mature in the lower grammar grades be given the opportunity to obtain such form of instruction in the elementary school as will directly prepare them for immediately taking part in active life."[23]

One hundred and fourteen classes in seven elementary schools in New York were arranged in physiological age-groups. In reply to a questionnaire, most of the teachers expressed themselves as favoring the segregation. They were practically unanimous in reporting a more unified class consciousness, which was advantageous to discipline. Further results, as indicated by the replies of the teachers, showed the mature were 'slower' than the immature; that both groups worked better when segregated; and that the approach to the subject-matter was different for the immature and the mature.[24]

King studied a group of 272 children between the ages of 10.5 and 17 to ascertain the correlation between maturity and scholarship as shown by marks, first classifying them without reference to chronologieal age into three groups: immature, maturing, and mature. This classification showed that both boys and girls in the immature stage ranked higher than those maturing or mature. When he compared the marks of children of the same age but different degrees of maturity, he found the reverse to be true. He says:[25]

> While the number of cases is too small to furnish conclusive evidence, it points, in general, to this conclusion: The children of advanced development in these years are superior in scholarship to those who are less fully developed.

Foster classified 295 boys of an entering class of a New York City high school into eight sections according to physiological age based upon pubescence. These he compared with reference to dis-

[23] Crampton, C. W. Anatomical or physiological age versus chronological age. *Ped. Sem.*, 15: 1908, 230-237.

[24] From the Fifteenth annual report, physical training and hygiene, New York City, 1912-13, pp. 24-26.

[25] King, I. *The High-School Age.* 1914, 235 p. (p. 53.)

charges, failures, and promotions, with 149 other boys grouped into four divisions. Another group of 18 boys, classified indiscriminately, furnished a further basis of comparison.

Foster says:[26]

> Records of smaller boys * * * * show fewer discharges, fewer failures, and more promotions. In fact, the four classes of the smallest boys average almost 20 per cent more promotions than the classes of largest boys. This apparently bad showing of the larger boys is to be explained by the fact that many of them have been delayed in their progress at school or by circumstances at home. Going to work is usually out of the question for a small boy, and in social affairs and in athletics he is not at all successful. The influences that tempt the big fellow to neglect school duties do not have the same force against the smaller boy.
>
> The marked difference seems to be in the matter of discharges. May this difference not be due to the grouping of the boys of the same development making work so much more enjoyable that they do not have the same inclination to leave school?

Basing his judgment on Crampton's tables, Johnson estimates 45 per cent more pubescent and adolescent boys are found in the Cleveland elementary schools than in the high schools. Johnson's immediate concern in this instance was with recreation, and from the foregoing deduction he asserts that to confine adolescent games to the high school is an inconsistency in the administration of educational opportunities, for the need of such games is at least as great in the elementary schools. Again, the "practice in hardy games ought to be before the age when the most pupils enter the high school. The prepubescent years from 10 to 12 are, for the majority of boys, especially favorable for the beginning of athletic interest and skill. If participation is delayed beyond the elementary school period, sufficient interest and skill for personal participation in later years are far less likely to be developed."[27]

Although the significance of physiological age is not recognized as some investigators think it should be in the actual treatment of children, attention has been called from time to time to its importance. Dr. Meylan, of Columbia University, writes (in a personal

[26] Foster, W. L. *loc. cit.*, pp. 83-88.

[27] Johnson, G. E. Education through recreation. *Cleveland Survey Foundation*, pp. 34-35.

letter) that in connection with his work with boys he has adopted for grouping for athletic contests four factors: Chronological age, physiological age, height, and weight; and that he has found physiological age absolutely essential in grouping for competition not only in athletic and aquatic sports but also in such subjects as nature-study, camp-craft, book reading, rifle shooting, and manual training. His experience leads him to believe that the factor of physiological age should be given much consideration by school teachers and superintendents in all phases of work.

P. Tecumseh Sherman, in his report as commissioner of labor, New York State, 1907, says that "there should be added to our law a requirement of a fixed minimum standard of physical development as a condition to granting a certificate of fitness to work in a factory." The National Education Association recommended in 1911, that child labor laws be so modified as to recognize the difference between the chronological age of a child and his maturity, and that the school-age limit should be determined not by the fact that the child has reached the age of 14 or 16, but by "physio-psychological data corresponding to the normal standard for the age limits required by the law. All children or persons failing to meet such maturity tests at the extreme school-age limit should remain under public supervision and control, either until they reach maturity or permanently." The committee on medical inspection of schools of the American Medical Association recommended that physical and developmental examinations should be sufficiently extensive to determine, as far as possible, the cause of arrested mental and physical growth; and that these data, taken in connection with the curriculum of the school and the sociological factors of the pupils' environment, "should form the essential basis for the adjustment of educational activities, both physical and mental, to meet the requirements of physical and mental health, growth, and development."[28]

As a result of extensive experiments, Crampton recommends:

> Where mature and immature children are now brought together in the same class in the elementary or high school, they should be separated into

[28] Instances cited by Crampton. *Int. Cong. on Hyg. and Demog.*, 3: 1912, 224-236.

different classes, so that the pedagogical, ethical and social treatment to which they are subjected may be better adapted to their disparate and distinct requirements and abilities.

Child-labor legislation should be based upon physiological age.

All observations, records and investigations of children, and all treatment of children, whether pedagogical or medical, social or ethical, must regard physiological age as a primary and fundamental basis.[29]

SEGREGATION OF THE SEXES IN THE SCHOOL

Whether girls and boys ought to be educated in the same classes should probably depend upon: (1) Whether the two sexes need training so different as to call for separate classes; and (2) whether the mental and physical characteristics of the sexes are so different as to necessitate separation in instruction. The first principle involves the discussion of curricula, but it may be pointed out that there are certain subjects where co-instruction can hardly be given. Thus, in many of the subjects given in industrial arts curricula, and in physieal training, the sexes cannot be handled together. In social or civic education the content may be the same in some particulars and different in others, while in the so-called classical subjects the content might be the same.[30]

According to Hall, boys and girls of the early adolescent age tend naturally to separate, for at least a few years and the family and home recognize this tendency. At the age of twelve or fourteen, brothers and sisters develop a life rather independent of each other, with different interests, home occupations, and games. This he believes to be natural and biological. It is often asserted, also, that boys do not like to enter into competition in school studies with girls at this age, perhaps because they recognize that girls excel them. Observations show ill health to be much more prevalent among girls than boys during the pubertal period and for the time immediately following, owing to the greater physiological change through which girls pass. Consideration of this point leads Burgerstein to believe that when curricula are heavy, it may be more healthful to present only a part of the studies in co-edu-

[29] Crampton, C. W. Anatomical or physiological age versus chronological age. *Ped. Sem.*, 15: 1908, 230-237.

[30] Snedden, D, and Henderson, E. N. Co-education. Monroe's *Cyc. of Educ.*, vol. 2, pp. 43-46.

cational classes, and to arrange the curricula in such a way as to take account of the different physical resistance of the two sexes as well as their different mental ability, for with boys the period immediately preceding puberty is of minor resistance, while with girls it is the period of development itself and the years immediately following. He also notes that after the pubertal development girls surpass boys of the same age in class work.[31] Other writers have asked whether the health of girls may not be permanently impaired through too close devotion to the program of studies at this age.

As we have seen, girls mature on the average two years earlier than boys. Whether mental change be sudden or gradual, the maturity of the average girl of fourteen would seem to be sufficiently in advance of the maturity of the average boy of the same age to possess real significance educationally. If the theory that mature children require a different treatment from the immature is valid, it can be concluded that a certain amount of segregation will be desirable.

A noteworthy experiment in "limited" segregation was undertaken by Principal Armstrong in the Englewood school in Chicago. While he would not have boys and girls attend separate schools, the results of this experiment lead him to believe that limited segregation is desirable. He says segregation during the first and second years of the high school—ninth and tenth years—holds more boys in school, greatly improves their scholarship, and removes from them the feeling of unfair comparisons due to difference in degree of maturity of children of the same age but of opposite sex; while the possibility of adapting the work to the needs of each sex makes it easier to train for a higher degree of efficiency. A large majority of the teachers, practically all of the boys and a majority of the girls favored segregation; while the vote of the parents stood two to one in favor of the plan, with 90 per cent of the parents of the segregated children voting favorably.[32]

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[31] Burgerstein, L. Hygiene of co-education. Monroe's *Cyc. of Educ.*, vol. 1, pp. 652-655.

[32] Armstrong, J. E. Limited segregation. *Sch. Rev.* 14: 1906, 726-738. Advantages of limited segregation in the high school. *Sch. Rev.*, 18: 1910, 339-350.

ADMISSION TO THE JUNIOR HIGH SCHOOL

The problem before the superintendent or principal with regard to classification of pupils reduces itself to these questions: (1) Who shall be admitted to the junior high school; and (2) how shall those admitted be classified? The answers to both these questions may perhaps be summed up under two heads: (1) working ability, and (2) instruction needed. These would include the health of the pupil; his natural capacity and interest; the probable time to be devoted to school work; and his command of the English language.

At the present time the majority of superintendents require the pupil to "complete the preceding grade" before he is admitted to the junior high school. There is something in this phrase which implies a certain amount of work that a pupil is required to complete in one grade before he is judged able to do the work of the next; and it also implies, that, if he has not done this work, he is not able, or at least he is not to be allowed, to attempt the work of the next grade. Against this proposition may be advanced the argument that working ability does not depend wholly upon work previously done or the amount of information acquired. Complaints of 'lack of preparedness' made by teachers from the college down, show that much of the required knowledge, power, or skill, as the case may be, has either never been acquired where it is supposed to have been or that it has been lost by the student. This point also involves a consideration of the psychological versus the logical method of apportioning subject matter. Further, results of tests in arithmetic, spelling, penmanship, etc., show that pupils in a single grade may vary in ability to the extent that a third may represent the average ability of the grade below, and perhaps a third represent the ability of the grade above. Finally, the majority of the arguments used against entrance examinations for the high school and college may be used here against requiring a pupil to "complete the work" of one grade before he is admitted to the next.

Examination of tables of the distribution of children by age and grade shows that in any school system we may expect to find

pupils who, assuming maturity at the average age, have been mature for one or more years before they are admitted even to the seventh grade. An extreme case was found in Portland, Ore., where the survey brought to light the fact that in the first six grades the children ranged from six to nineteen years in age, while in one grade was found a range of eleven years and in other grades a range of from one to ten or fourteen years. From this it was judged that an age-range of five years or more would be found in any grade from the first on, since no measures were taken in Portland to segregate pupils on account of age.[38] Pupils who have matured before they have reached the junior high school may be normal mentally, but retarded through ill health or absence from school, or they may be retarded because below normal mentally. In either case they can hardly profit much from instruction adapted to children chronologically and physiologically years younger than they. Moreover, these older pupils tend to be rapidly eliminated.

In inaugurating changes in the classification and treatment of children of the junior high school, two things must be considered. First, unless the child's previous experience is ignored, there will always be a factor which will make for moderation in the transition from methods employed in the first six grades to those to be employed later on. In other words, methods to which the pupil has become accustomed in the lower grades cannot be ignored by those organizing the junior high school. Second, as Inglis has shown, the organization of the junior high school will be substantially the same whether the saltatory or the gradual theory of development be accepted. In the first instance the variability of the time at which pupils arrive at pubescence would prohibit a radical change of method to correspond with accompanying psychical changes. Inglis says:

> The gap between the last grade of the elementary school and the first grade of the high school as our system is at present organized is great and the readjustment which faces the boy or girl when transferred into the high school is tremendous. It is one of the principal aims of the reorganization of our system of education to eliminate that gap, to facilitate the necessary ad-

[38] Report of the survey of the public-school system of school district No. 1, Multnomah County, Oregon. City of Portland, 1913. Chapt. 9.

justment, and to ameliorate the articulation between elementary and secondary education. * * * * If we adopt the theory of gradual development with reference to mental traits, we must recognize that our school system should be so organized that from the first grade of the elementary school to the last grade of the high school the change for the pupils will be gradual and without points of abrupt transition, without sharply differentiated administrative divisions, and without radical changes in materials and methods at any one stage. If we adopt the theory of saltatory development, we are forced to the same conclusion because of the variability found at any one stage and because of the distribution of pupils throughout the grades.[34]

PRESENT REQUIREMENTS OF ADMISSION

In response to the question: "Upon what do you make entrance to the junior high school depend?", 68 out of 94 replies mention nothing more than "promotion", "completion" or "satisfactory completion" of the preceding grade. In this connection it is interesting to note that the California state law provides that the "high-school board of any high-school district or the trustees of any high school, may prescribe intermediate school courses, and admit thereto pupils who have *completed* the sixth year of the elementary school;" and that the school systems of California uniformly have this requirement.[35] A similar situation is found in Vermont.

Four other schools admit upon recommendation of the teacher or principal; four others consider primarily the child's ability to carry the work; and one makes no special requirement. Eighteen additional systems mention specifically that they admit "big" boys and girls, "over-age" pupils, "mature" pupils, or pupils who are "out of place" in the elementary school, whether they have completed the elementary course or not. Four of this latter class have exceptionally liberal entrance requirements. At Lafayette, Indiana, a pupil is admitted if he possesses the "ability to compute the form processes in arithmetic; ability to read intelligently; and ability to write well." At the Wisconsin High School the "requirements for admission to the sixth class [corresponding to the

[34] Inglis, A. J. A fundamental problem in the reorganization of the high school. *Sch. Rev.*, 23: 1915, 307-318.

[35] *School Law of California*, 1915, p. 152. Italics are the author's.

seventh grade] are "(*a*) ability to read, write, and speak simple English with *reasonable ease and accuracy.* (*b*) good health, (*c*) twelve years of age. (Applicants under twelve years of age will receive special attention, and if they show a *mental age* of twelve years or above, they may be admitted)." Solvay, New York, has essentially the same requirements, save that mature pupils are admitted from the elementary school—a department not maintained in connection with the Wisconsin High School. In Cincinnati admission depends upon "age, schooling, interest of the child, and recommendation of the principal."

A number of cities have segregated classes because different curricula are being planned for the sexes; three have tried segregation for psychological reasons, but find no advantage accruing therefrom;[36] one would have segregation if the school were large enough; three schools will try some experiments in segregation;[37] six maintain separate classes for the sexes in whole or in part,[38] of which three are convinced that segregation has special advantages for pupils of this age. Two places have groups classified according to physiological age[39] (See Appendix, Section 3).

SUMMARY

A consideration of the mental and physical qualities of the adolescent points toward the following tentative conclusions:

1. There is psychological justification for the claim that educational practice should differ both in content and method for the pupil of the adolescent stage as compared with the pupil of the preadolescent stage.

2. Physical mental maturity, for which chronological age can not be taken as a criterion, should play an important part both in classification as to grade and group within the grade.

3. Since girls mature on the average two years earlier than boys, and since the changes through which the girl passes at this

[36] Chanute, Kan.; Houston, Tex.; Richmond, Ind. Richmond has found it advantageous to separate the sexes in assembly.

[37] Evansville, Ind.; Saginaw, Mich.; Paducah, Ky.

[38] Santa Rosa, Cal.; Santa Ana, Cal.; Roanoke, Va.; Brookings, N. D.; Trenton, N. J.; Rochester, Minn.

[39] Lafayette and Evansville, Ind.

stage are by no means parallel with those of the boy, a certain amount of segregation will be required for psychological and hygienic reasons, as well as for more utilitarian purposes.

4. Boys and girls who are clearly mature should not be kept in elementary classes with children who are physiologically younger, but they should be advanced to the instruction of the intermediate stage, whether they have completed the work of the preceding grades or not. It is the duty of the junior high school to provide suitable instruction for such pupils.

5. On account of the great variability in chronological age at which pupils arrive at maturity, methods of instruction should not be radically changed, even when the saltatory theory of mental development is held. Such a change in methods could be seriously considered only if pupils were grouped according to physiological and psychological development.

6. Previous methods of instruction to which the pupil has been accustomed should be a governing factor in the formulation of methods of instruction for the junior high school.

7. Further experimentation in segregation as to sex and grouping as to physiological age is needed. These plans, if demonstrated to be valuable, could be introduced into many high schools.

CHAPTER III

THE CURRICULUM

GENERAL PROBLEMS

The educational aims of the junior high school are dependent upon those of the complete educational system, of which it is one unit. Educational aims are commonly stated in terms of social efficiency and individual development. Differences in regard to the formulation of the junior-high-school curriculum arise according to the way these aims are interpreted, defined, or stressed; and according to the system of educational psychology the interpreter has formulated. The main controversy relates to industrial education and the differentiation of curricula. To some, the industrial activities of a community indicate that curricula paralleling them are to be offered in the junior high school because its students are soon to earn their livelihood in the industries; to others, community activities determine the curricula because they afford the real basis of instruction, or, in other words, because the pupil's potential knowledge or ideas have been formed and will be formed from his interaction with his environment. Still others believe that a certain amount of knowledge should be the common property of all, and that it is the duty of the schools to define these elements of knowledge and incorporate them in the curriculum. To the first group, a certain amount of skill is necessary for utilitarian purposes; to the second, skill or specific habits are entirely subservient to the educative process; to the third, specific habits are subservient to the acquisition of certain essential elements of knowledge or constants. Each of these three points of view includes the others to a degree determined by the amount of emphasis given to the particular point of view, to the educational psychology of the theorist, and to his general philosophy of education.

Democracy in education is a popular theme. For some, it means that the school shall give each child a maximal individual

development according to his ability and interests. These educators often accuse the high school of having ministered to the needs of a selected group only and declare that it must now minister to the needs of any and all. For others, democracy means unification; our common problems of life and government will be better met and handled by those who have learned to reason, and who have been impressed by the duty they owe to the nation and to society. While these educators are somewhat satisfied with the past accomplishments of the schools, they nevertheless recognize the necessity of reorganizing the present school system. Their chief concern, however, is with the content of the curriculum. A third group of writers makes more or less successful attempts at reconciling these two attitudes.

Such divergent views naturally entail controversy when a readaption of the curriculum is undertaken. It is agreed that the schools should give the best preparation for life. But is this preparation best given by making the schools train somewhat specifically along lines indicated by social and industrial demands—a conception which requires separate curricula and perhaps separate schools; or is it best given by a curriculum built upon social demands, but which develops skill in industry only to the extent that it facilitates the advance of the educative process? The former plan implies less and the latter more differentiation according to individual tastes and capacities. Or, again, would not an individual be better fitted for life if he were to master those common elements of knowledge that may be proved to be worth while, and can not these be better presented in a common curriculum? Indeed, if we agree that it is the function of the junior high school to give this stock of common knowledge, does this not mean that pupils will be engaged in the same work, and that there will be but little differentiation as a consequence?

Snedden defines vocational education as that education which trains the individual to be an effective producer, and cultural education as that education which trains the individual to be the best consumer. In this sense he makes production along any line—professional, artistic, spiritual, or economic—the result of vocational education, while in the expenditure of leisure, in reading papers,

magazines, and books, and in the appreciation of art or music, or in the consumption of food, cultural education would function.

"Vocational education differs from general, or liberal, education fundamentally as regards its essential aims, and that, therefore, it will differ also, fundamentally, as regards the means and methods of instruction, as well as the administrative agencies which are intimately related to means and methods of instruction. It is further contended that vocational education and liberal education cannot be effectively carried on, so far as regards a given group of pupils, in a way which permits of a considerable blending of the unlike types of instruction. To attempt this is to defeat the aims both of liberal and of vocational training. One of the essential conditions of genuine efficiency in either liberal or vocational education is a considerable degree of concentration on the part of the pupil on the one type or the other, so far as regards the expenditure of this time and energy in any given time."[1]

Snedden makes essentially the same distinction for the subjects of the junior high school. In discussing "courses for youths of 12 to 14 years of age" he sees two prime factors that will make for a wider latitude in making individual programs of study: (1) "the number and variety of subjects of training and instruction;" and (2) the "variability of the educational needs." He then classifies school subjects into two types, and says that "the conspicuous result expected in the case of the alpha type is ability to *do*, to *express in action*, while the most tangible result expected in the case of the beta type is *appreciation* or, in one sense of the words, *interest*." In a suggested curriculum he indicates that some of the subjects will be predominately "alpha," some predominately "beta;" and some either "alpha" or "beta," depending upon the student. The basis for both positive and negative proscription of subjects will be natural endowment—the requirement that the pupil receive instruction and training necessary or greatly advantageous to him in after life—and social demands. "A heavy burden rests upon authorities to establish the presumption that it is *better* that these proscriptions should thus be made than that each pupil, subject to the general requirement that he must

[1]Snedden, D., and Bagley, W. C. Fundamental distinctions between liberal and vocational education. *Proc. N. E. A.*, 1914, 152-3.
Snedden also makes this distinction in his *Problems in Educational Readjustment*. p. 115.

employ all of his school time profitably, shall freely elect his own course."[2]

Bagley does not agree with this distinction between liberal and vocational education. He believes it is really the old one of education for leisure and education for work. He points out that an individual does not produce for a certain period, and then consume for another period, but as a producer an individual is also a consumer. Certain fundamental activities, he says, cannot be classified either as predominately productive or as predominately consumptive, while certain essential facts are neither productive nor consumptive.[3]

With regard to vocational education, Dewey holds that the guiding aim must be first of all to keep youth under educative influences for a longer time. Gary, Chicago, and Cincinnati, have shown that the best way to reduce elimination is to make instruction significant to pupils. But "in these places the aim has not been to turn the schools into preliminary factories supported at public expense, but to borrow from shops the resources and motives which make teaching more effective and wider in reach." "In the second place, the aim must be efficiency of industrial intelligence, rather than trade efficiency." Providing skilled workers, even in superior crafts, is not the chief problem. Extreme specialization in manufacturing processes, automatic machinery, the rapid change by means of inventions of the forms of machine industry, the extreme mobility of the laboring population, and the fact that 95 per cent of the labor employed in the construction of such a complicated machine as the automobile, are facts that "cry aloud against any trade training that is not an integral part of a more general plan of industrial education. They speak for the necessity of an education whose chief purpose is to develop initiative and personal resources of intelligence." The preparation of skilled laborers for the trades that we have today would, moreover, tend to keep the present industrial regime as it is, and would not tend to work any

[2]Snedden, D. The character and extent of desirable flexibility as to courses of instruction and training for youths of 12 to 14 years of age. *Educ. Ad. and Super.*, 2: 1916, 219-234.

[3]Bagley, W. C. Fundamental distinctions between liberal and vocational education. *Proc. N. E. A.*, 1914, p. 164.

change, which is highly desirable.[4] Nor is it altogether true that definite trade training would always mean competency for self-support. One of the causes of incompetency and poverty lies in the fact that individuals have been educated to only a special line of activity, which is transformed or even eliminated by social progress.[5]

Dewey states his position with reference to the dual system of control of the vocational and the regular school system in no unmistakable terms. He opposed the proposed Indiana legislation and the Cooley bill on the following grounds:[6] It will produce class stratification, because there will be a segregation of the children of the more well-to-do families of the community from those children who will presumably earn their own living by working for wages in manual and commercial employments. But this is not all. These schools were to be established entirely separate from the present educational system, directed and taught by a different body of administrators and teachers, and receiving their support directly from the state. Dewey asks if any sound reasons could be advanced against further administrative segregations in behalf of religious creeds or foreigners, if commercial bodies and employers of labor were to procure a state supported system of schools in their own behalf. Not that all the employers are seeking their own ends, but that those who are doing so do not realize that there will be a tendency towards class stratification. Again, in the wide-spread educational adjustment taking place at present, an attempt is already being made to add to the curriculum certain subjects of the vocational type. If two types of schools should be established, the result would be a duplication of facilities, with added expense; the forces effecting a re-adaptation of the traditional curriculum of the elementary and high school to meet the change of social conditions, would be driven into a narrow channel, while the old curriculum would be "left frozen in its narrow form."

[4]Dewey, J. A policy of industrial education. *Man. Tr. and Voc. Educ.*, 16: 1915, 393-397. Published also in *The New Rep.*, 2: 1914, 11-12.

[5]Dewey, J. Philosophy of education. Monroe's *Cyc. of Educ.*, vol. 4, pp. 697-703.

[6]Dewey, J. Industrial education. A wrong kind. *The New Rep.*, 2: 1915, 71-73. Splitting up the school system, *Ibid.*, 283-284.

Snedden and Dewey are not at agreement at this point.[7] To Snedden's mind, the question of unit or dual control is not fundamental, but rather the question: "what constitutes sound pedagogic theories as to the aims and methods suited to vocational education in schools, and secondly, the most effective organization and administration of the means designed to realize them." It has been shown that Snedden draws a distinction between vocational and liberal, or cultural, education, and believes these two forms of education cannot well be carried on together. Social and economic conditions, he adds, make evident the need of vocational training, since only a few of the industries are so organized that they can give a good vocational training. Moreover, schoolmen, however well intentioned, are apt to be impractical and fail to appreciate actual conditions. Three distinct conditions are necessary if this form of education is to be effective: practical participation in productive work; technical studies related to productive work; and general vocational studies designed to promote the vocational branches. Teachers must be masters of the trade or calling they are teaching,[8] for experience has taught us the ordinary school man has inadequate ideas concerning vocations and is incompetent to teach them. Therefore, he reluctantly concludes, if we are to have vocational education for the rank and file of the youth as well as for the favored classes, we must supply special schools for this purpose.

In reply, Dewey says Snedden should define what he means by vocational education. He himself believes vocational education does not mean the "identification of education with acquisition of specialized habits in the management of machines at the expense of an industrial intelligence based on science and a knowledge of social problems and conditions." Vocational education has as its supreme regard the development of such intelligent initiative, ingenuity and executive capacity as shall make workers, as far as possible, the masters of their own industrial fate.

The "demands of society," as far as trade training is concerned, are formulated by the representatives of the different in-

[7]Snedden, D. Vocational education. *The New Rep.*, 3: 1915, 40-42.
Dewey, J. Education vs. trade training. *The New Rep.*, 3: 1915, 42-43.
[8]Snedden, D. *Problems in Educational Readjustment.* Ch. 8.

dustries. This is recognized by educators who discuss vocational training for the public schools. In this connection, it is interesting to note the attitude taken by some of the leading corporation schools. Steinmetz, for example, calls the corporation school a continuation school and says that, since its success is dependent upon the character of public-school pupils, the period of general education should be lengthened rather than shortened. He would have such subjects as manual training taught for educative and recreative value and as means of physical development, but stands squarely against the extreme utilitarianism which some would bring into the public schools. He says: "Vocational training, as extension work after graduation from general education, is necessary to retain our industrial advantage. But instruction in the trades, vocational training in the grades, is, in my opinion, vicious and should be opposed."[9]

According to the literature on corporation schools it would seem that his view is fairly representative. Furthermore, it is the policy of some of these schools to train not only in specific trade habits, but to introduce academic and "cultural" subjects as well.

Bagley attacks the problem from the side of democracy or social solidarity. A high level of common ideas—which are the implements or means of thought—"is essential to collective thinking on a high plane," and the "efficiency of a democracy is directly dependent upon the number of ideas that are common to all the members of the democratic group." An evaluation should be made of the elements of the different subjects, such as history or arithmetic, in order that the most valuable will be taught; and there should also be enough uniformity to enable all pupils to acquire these common elements. Social solidarity can best be insured if the schools devote their efforts toward the elevation of the general level of common intelligence, which is "pretty clearly indicated by the extent of the common elements in the school program."[10] He

[9] Steinmetz, C. P. The relation of the corporation school to the public schools. *Nat. Assn. of Corporation Schools, Rept. of first annual convention*, Dayton, 1913, pp. 297-301.

[10] Bagley, W. C. The justification of a certain measure of uniformity. *Univ. of Ill. Sch. of Educ. Bull. No. 13*, 1914, 12-21.

calls the doctrines of freedom, interest and spontaneity, "indispensible ingredients" of an "effective educational theory." They must, however, "be supplemented by the more virile virtues of duty and of effort and of sacrifice." He stresses effort as necessary to mental growth, accuracy and thoroughness as fundamentals, and order and sequence as essentials to mental mastery.[11] He says with regard to individual differences that all children cannot be put through the same "educational mill," but believes that, until more study is given to the evaluation of the present curriculum, we will not be in position to say with any certainty just how much differentiation should be made.[12] In any event, "if ever a country should adopt the policy of an iron education, it is our country at this time."[13]

This view led Bagley to make a vigorous objection to the curricula outlined by Ayres in the Springfield survey, which provided for differentiation beginning with the seventh grade. He questioned Ayres' interpretation and comparison of European educational systems, and asserted that social stratification similar to that in Europe would result from a differentiation such as outlined by him.[14]

This challenge elicited from Judd a reply as vigorous. With regard to the European situation, he stated that the psychological and pedagogical considerations underlying their schools are not fundamentally different from those with which we have to deal.[15] Psychologically, the essential consideration is that the twelve-year-old is in the first "flush of adolescence"—he begins to have individuality, to look upon a larger world, and to consider his duty to himself and society. Moreover, he will be half through adolescence at the age of fourteen or fifteen, and we must therefore begin with the beginning of adolescence if we would exert the

[11]Bagley, W. C. Some handicaps to education in a democracy. *Sch. and Soc.*, 3: 1916, 807-816. See also Snedden's discussion of this article, pp. 816-818.

[12]Bagley, W. C. The justification of a certain measure of uniformity. *Univ. of Ill. Sch. of Educ. Bull. No. 13*, 1914. 12-21.

[13]Bagley, W. C. Some handicaps to education in a democracy. *Sch. and Soc.*, 3: 1916, 807-816.

[14]Bagley, W. C. The six-six plan. *Sch. and Home Educ.*, 34: 1915, 3-5.

[15]Judd, C. H. The junior high school. *Sch. Rev.* 23: 1915, 25-33.

largest influence. This means the elementary method naturally ends with the sixth grade, and with the seventh, differentiation must be made because of individual differences.[16] The eight-four plan is not a product of a struggle for democracy, nor has it been proved that the high school is democratic. The elementary school "was at the outset an undefined, and in many respects, unlimited institution," as is shown by different schools of seven, eight, or nine grades. But the old grade-high-school plan is unnatural, and is being abandoned. We need to "remove the obstacles to progress now found in the high school and grades," and make for true economy by avoiding wasteful duplication, by facilitating progress, and by unifying the school system. In Judd's opinion, the real danger connected with the junior high school is that there may not be sufficiently thorough pedagogical and psychological study given to the reorganization of the subject matter.

In different articles and editorials that he has written, Johnston[17] leaves no doubt about his position upon curriculum differentiation. He characterizes as "absolutists" those who would carefully select certain "absolute essentials" for all pupils, and who favor a non-differentiated curriculum through the junior high school to bring it about that all pupils should be taught these "absolute essentials." Such a plan is a "daring dream of national uniformity" and "tends to remind us forcibly that the belief in content is still widely current." In his opinion, as in Judd's, pupils between the ages of 13 and 15 are by nature different, and hence require different treatment. As a "socialized conception of all education" will furnish the medium for development, there will come as a consequence a "richer democracy of real self-directing individuals who have had meted out to them by a public educational system the sort of education which the industrial and social state made necessary, as well as the sort always necessary from the very fact of the humanity of man himself."[18]

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[16] Judd, C. H. The junior high school. *Sch. Rev.*, 24: 1916, 249-260.

[17] See *Educ. Ad. and Super.*, vols. 1 and 2.

[18] Johnston, C. H. What is curriculum differentiation? (Editorial) *Educ. Ad. and Super.*, 2: 1916, 49-57.

Johnston distinguishes two forms of curriculum making. One of these he refers to as clerical and manipulative, and the other as discriminating and educational. The former shows skill on the part of the principals in organization and systematization alone, while the other represents keen insight into individual and group differences. By means of a manipulative program, a large number of curricula are frequently shown in a school, though in reality but slight variation exists between them.[19] He evidently is of the opinion that the average high-school principal makes curricula in this manner, while on the other hand educational theorists do not give advice specific enough to aid him in his work. Thus, the following quotation:

Bewildered American High-School Principal: Gentlemen, I have no such clear ideas of the purposes of the high school as have my visiting colleagues from Europe or the University specialists here present. Whenever we American high-school principals hear of some new curriculum we at once regroup our high-school subjects and thus provide, on paper, the curriculum desired. Most of these curriculums, however, are merely the result of a re-shuffling of courses. They are merely paper curriculums. As a matter of fact, we have in America no "pillar theory" of curriculum construction. I recently read carefully the published curriculums of high schools of American cities with about 20,000 population. These 40 schools offered 180 curriculums, averaging more than four curriculums each. I know that no one of them furnishes four thorough and distinguishable trainings for as many intelligibly grouped divisions of the students. I myself print eight curriculums for our pupils, but most of them represent varieties of the college preparatory. Those that do not are vocational mainly in name. From the points of view of the functions of secondary education the principles of curriculum construction, the basis for assigning students to curriculums, systems of educational and vocational guidance and the securing of teachers of vocational education, I am forced to admit to this body that I am entirely at sea. I feel that the American high school is somehow on trial, and that radical readjustments are impending. I have found this conference absorbingly interesting. I hope, however, engrossing as these speculative questions are, that something more definite may issue from it before we adjourn. We principals have to do something each day. We wish safe guidance.[20]

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[19] Johnston, C. H. Curriculum adjustments in high school. *Sch. Rev.*, 22: 1914. 577-590.

[20] Johnston, C. H. The high-school issue. A symposium. *Educ. Ad. and Super.*, 7: 1915, 29-49.

A discriminating program, on the other hand, is organized with reference to individual needs.[21] Johnston does not believe a "discriminating program" will rigidly separate groups of pupils, thereby working an educational disadvantage to some—although he recognizes this is a possibility—because a number of courses will function in different curricula. If courses are modified for their different "curriculum settings," this in no way "precludes or lessens the probability of their preserving their distinctive educational values as 'subjects'."[22]

However, certain principles are common to discussions of subject matter. On the one hand is the tendency to take definite account of the pupil's experience as the starting point of all instruction, and consequently to draw upon the immediate environment for subject matter; on the other hand is the tendency, perhaps more marked in the elementary school, to fix certain constants of instruction. One of these views does not necessarily exclude the other. They come closely together in that the constants are chosen because of their importance and frequency in daily life, which means the constants are the most common environmental elements found in the life of the average person. However, the points of emphasis differ, being the child in the first case, and subject matter in the second. Emphasis upon the psychology of adolescent and the principle of interest[23] brings it about that less heed is given to the acquisition of standardized subject matter; while with increased stress upon the acquisition of subject matter comes a tendency to lose sight of the psychological makeup of the child.

The word "cultural" is given many meanings, the most common being almost synonymous with "informational" or perhaps "conventional," and is applied to subjects closely akin to those found in the "old curriculum" in comparison with the more "useful" subjects of a prevocational or vocational character. "Cultural" is used by other writers to mean that "habit of mind which

[21] Johnston, C. H. Curriculum adjustments in high school. Sch. Rev., 22: 1914, 577-590.

[22] Johnston, C. H. What is curriculum differentiation? (Editorial) *Educ. Ad. and Super.*, 2: 1916, 49-57.

[23] See Dewey, J. *Interest and Effort in Education.* 1913, 101 p.

perceives and estimates all matters with reference to their bearing on social values and aims." Again, "culture must be related to the student's future life. I do not believe that any real culture comes from following a prescribed course of study; but culture will always come with the love of the work being done, from a realization that the work has a clear relation to the future vocation." According to this conception, any subject may be cultural.[24]

None denies that the curriculum must be "vitalized" or made "more worth while" to the pupil. Here again is a term with a dual significance. For some, "vitalization" means the application of social conditions to arithmetic—using social conditions to study arithmetic—; for others, it means the application of arithmetic to social relations—studying social conditions and learning arithmetic as a consequence.

Current educational psychology deals for the most part with response to the environment; less account is taken of original nature than of the environmental elements. Only occasional references are made to transfer of training. None advocates teaching any subject for the sake of its formal training alone, but the majority would teach each subject in such a way as to secure from it "all possible drill in correct methods of thinking and worthy ideals of mental action."

PRINCIPLES UNDERLYING REORGANIZATION OF THE SEVERAL SUBJECTS

English. The commonest ends set forth in the teaching of English are the appreciation of the works of standard authors and an increased power of oral and written expression.[25] Somewhat subservient to these ends is the insistence that many place upon the development of the ability (which should be definitely measured) to read silently. To these aims is added the inculcation of moral principles through the study of literary characters; while an effort is also made to make the youth realize that convention de-

[24] See Hall, G. S. *Educational Problems.* 1911, 2 vols. (Vol. 1, p. 588.)

[25] Preliminary statements by chairman of committees of the commission of the N. E. A. on the reorganization of secondary education. *U. S. Bur. of Educ. Bull. No. 41,* 1913. 80 p.

mands correct language, thus stimulating the tendency to correct speech. Little or no emphasis is placed on the technique or development of literature as such. Penmanship, spelling, grammatical and rhetorical structure are accordingly made tools of expression. These subjects, instead of being taught in isolation, are well grouped together under the subject "English," and each is made to contribute its share towards the goal aimed at by "English."[26]

In expression three things are fundamental:[27] first, there must be something to express; second, a real opportunity for expression must be provided; and, third, expression must be guided. Imagination does not mean playing with impossible material, but a constructive process based upon elements of actual experience. Therefore, subjects for written and spoken English will be those arising from the vocational activities of the pupils, from their dramatic, athletic, or other school interests, from the reading of wholesome magazines and books, or from any other interest. In like manner, assigned readings whose form and content are beyond the pupil will not be made, but readings will be given which produce a genuine reaction because they contain elements found in the actual working knowledge of the pupil. This, of course, does not mean that no place will be found for the classics. If the approval of the social group is called into play, as in the classroom or auditorium, or if expression is vitalized in some other way, as in connection with the printing press, the opportunity for expression would be more ideal. Moreover, guidance in expression consists of emphasis skilfully placed upon the mechanics of oral and written expression as the occasion arises, while continued guidance should finally lead the pupil to some appreciation of technique in literature for its own sake.

Social Subjects.[28] Under the head of social subjects are included community civics, elementary economics, history, and often geography. It is intended that these studies shall aid the pupil in

[26] Lawson, M. F. The socialization of language study in the junior high school. *Ped. Sem.*, 23: 1916. 76-85.

[27] State Dept. of Educ., St. Paul. *Bull. No. 51*, 1914. p. 7.

[28] See The teaching of community civics. Prepared by a special committee of the commission on the reorganization of secondary education, N. E. A. *U. S. Bur. of Educ. Bull. No. 23*, 1915. 55 p. (Bibl.).

interpreting his immediate social environment and in establishing a standard of conduct with reference to civic institutions. The other aims of history—to train the reasoning powers, to give skill in forming judgments, and to afford ethical training—are not entirely neglected, but they are included in the social efficiency aim rather than made coördinate with it. Briefly, the method advocated is to begin with the study of the civic and economic problems in the immediate environment, and to follow these as they lead outside the home and school to the city or community, state, and nation. Obviously, those social factors most affecting the life of the child should receive first attention, and these will perhaps vary with the community to some extent. However, such topics as community health, industrial conditions, public recreation, city government, etc., are advocated as being suitable for all. It is to be insisted, however, that the pupil be brought into actual contact with the problems he is studying.

Chairman Jones of the Committee on Social Studies on Reorganization of Secondary Education, quotes approvingly Professor Robinson, who presents an ideal in history instruction:

> Obviously, history must be rewritten, or, rather, innumerable current issues must be given their historic background. Our present so-called histories do not ordinarily answer the questions we would naturally and insistently put to them. * * * * We ask, 'How did our courts come to control legislation in the exceptional and extraordinary manner they do?' We look in vain in most histories for a reply. * * * * It is only to be wished that a greater number of historians had greater skill in hitting upon problems of the present.

When this view is taken by those formulating junior-high-school curricula, little of the history taught in the seventh and eighth grades will remain, but history as such will be used to explain problems arising in connection with studies of present social significance.[29]

To find what cities having junior high schools were doing in the reorganization of their history courses, Tyron sent question-

[29] Preliminary statements by chairman of committees of the commission of the N. E. A. on the reorganization of secondary education. *U.S. Bur. of Educ. Bull. No. 41*, 1913. p. 23.

naires to 68 places. The returns lead him to believe that on the whole but little progress has been made. In the seventh grade, American history to about the year 1789 is given; in the eighth, American history from that date down to the present time is studied, but with the most of the emphasis given to the period ending with 1865. Ancient history is extensively taught in the ninth grade.

From his questionnaire returns and from other work done in history, Tyron suggests certain points to be considered by those working out junior-high-school history courses. He says:

> First, it must be recognized that the junior-high-school history is to follow a course that all have had thorough training in, and precede a course which all may or may not take. Secondly, the fact must be recognized that not all the pupils will finish the three years of the junior high school.* * * * In the third place, the course will be planned for the sake of the pupils taking it, rather than for the sake of the subject, history. * * * * Fourthly, there is a certain amount of history which all pupils must know before they can do any subsequent work in this subject with the best results. And, finally, the history courses in these grades must be made to function in the form of a key to a right understanding of present-day conditions.[30]

Mathematics.[31] In the place of arithmetic, algebra and geometry, which represent a logical and not a psychological sequence, a course in mathematics should be substituted which represents a unification of these three subjects after certain parts of each have been eliminated. Arithmetic, which will perhaps form the bulk of instruction in the seventh and the first half of the eighth grades, must be correlated with the life of the student, which means that emphasis will be placed upon the social and economic aspects of arithmetic. As an aid in analysis, however, the equation and the unknown term from algebra should be introduced wherever needed. Mensuration and other topics of measurement should be facilitated by the introduction of constructional geometry. The last half of the eighth year and the first part of the ninth

[30] Tyron, R. M. History in the junior high school. *Elem. Sch. Jour.*, 16: 1916, 491-507.

[31] See Breslich, E. R. Forward movements in secondary mathematics. *Sch. Rev.*, 24: 1916, 283-297. (Takes up the principle of mathematics for its own sake.)

will consist mainly of algebra, with special emphasis upon the equation, but at the same time the facts of geometry applicable to the work in algebra could well be given. Toward the end of the ninth year the work will be mainly geometry.

The following table, taken from Jessup, is based upon a questionnaire sent by him to about 1700 city superintendents and to every sixth county superintendent in the United States. It shows:

TABLE 5

THE PERCENTAGE OF SUPERINTENDENTS WHO FOR CERTAIN TOPICS FAVOR (1) ELIMINATION (2) LESS ATTENTION (3) ELIMINATION OR REDUCTION OF TIME; AND (4) MORE ATTENTION

	1	2	3
Apothecaries' weight	53	36	89
Troy weight	42	44	86
Furlong	72	19	91
Rood (sq. Meas.)	20	42	62
Dram	60	23	83
Quarter (avoirdupois)	68	17	85
Surveyors' tables	47	40	87
Foreign money	28	57	85
Folding paper	35	35	70
*Reduction	22	48	70
Long Meas. G. C. D.	35	40	75
L. C. M.	22	45	67
True discount	47	31	78
Cube Root	46	37	83
Partnership	25	44	69
Compound proportion	52	32	84
Com'p'd and complex frac'n.	26	44	70
Cases in percentage	20	35	55
Annual Interest	41	31	72
Longitude and time	8	31	39
Unreal fractions	74	15	89
Alligation	85	9	94
Metric system	20	44	64
Progression	67	20	87
Aliquot parts	21	32	53

	4
Addition	75
Subtraction	69
Multiplication	72
Division	70
Fractions	65
Percentage	50
Interest	39
Saving & Loaning	61
Banking	39
Borrowing	37
Bldg. & loan assns.	48
Investments	44
Bonds & stocks	20
Taxes	53
Levies	35
Public expenditure	55
Insurance	55
Profits	46
Public Utilities	57

*Reduction of more than two steps.

Jessup says:

The percentage of superintendents who favored the plan of increasing the emphasis upon certain subjects was tabulated so as to show the different attitudes toward each of the subjects suggested. A large percentage were in favor of giving more emphasis to the fundamental subjects such as addition, multiplication, and division. There was also a very strong sentiment in favor of increasing the emphasis on the applications of arithmetic to the

social and economic conditions of the day; such as the saving and loaning of money, taxation, public expenditure, insurance, etc.

Jessup found the median time spent upon arithmetic in the seventh grade is 150 minutes; in the eighth grade, 165 minutes per week. He adds:

Again, if one-fourth of the cities are able to get satisfactory results from 20 to 30 minutes per day or less in the fifth to eighth grades, certainly we have cause to question the reason why another fourth of the cities spend from 40 to 60 minutes or more per day in these grades. On the whole, it seems safe to say that the wide variation of recitation time in the various cities of the United States suggests the possibility of attempting to affect an economy of time by means of standardizing the number of minutes in the recitation period.

* * * * It may be said, however, that practically all of the investigations which have been made thus far on this subject indicate that there is less relation between the time expended and the achievement than many have supposed.[33]

After investigating first-year algebra, Rugg concludes:

The subject-matter of first-year algebra should be definitely organized in the form of a specific statement of (*a*) the 'mechanical' processes which should be drilled until perfectly habitualized; (*b*) the typical 'original' or applied problems in which should be given at least a definite minimum of practice in the application of the mechanical processes to new problematic situations.

The study of errors made by pupils indicates that *inefficiency in algebraic solution is due primarily to lack of mastery (habitualization) of a few typical operations which recur frequently in such solution.* .... This condition points to a need for a thorough study of (1) the psychology of the learning process in algebra; (2) the relative emphasis that should be placed on the teaching of certain processes, *i.e.*, the relative drill emphasis.[34]

Science. A spirited discussion has taken place recently with regard to the merits of general science as a high-school subject.[35] It might be thought that the question does not apply with equal

[33] Jessup, W. A. Economy of time in arithmetic. *Elem. Sch. Teach.*, 14: 1914, 461-476. Published also in *Proc. N. E. A.*, 1914, pp. 209-22.

[34] Rugg, H. O. The experimental determination of standards in first year algebra. *Sch. Rev.*, 24: 1916, p. 66.

[35] The *School Review*, Volume 23, 1915, contains a number of articles which present both sides of the question.

force to the junior high school, whose students are younger, but if it should be agreed that general science, on account of its composite nature, has no place in a four-year high school, a corresponding diminution in the number of such courses given in the seventh and eighth grades could be expected. It is argued by some that the true scientific attitude can hardly be attained through the study of "a mosaic made up of fragments of information" which "breaks up all natural connections and forbids the development of those ideas which relate and hold facts." It is argued by others that the unity originating from those facts of science which are found in the environment of the individual is the only true unity, for it approximates the unity of life itself. The latter view perhaps accords better with the pedagogical principles underlying the reorganization of the other courses.

It cannot be questioned that the present science courses need reorganizing. A plentiful supply of textbooks is in existence, containing fragments of botany, zoology, physics, chemistry, geography, etc. But little attempt has been made, and less success has been achieved, in making principles concrete through application. It seems, finally, that a majority believe there is a place in the curriculum for a general science of the right type.

Taylor's recent study throws some light upon the status of general science. Of 153 Iowa cities, 120 had courses in this subject, of which 12 were offering it one year and 21 one-half year. Of 196 California cities, 97 had courses in general science, of which 82 were offering it one year and 8 one-half year. In Iowa most of the cities gave general science 5 times a week; in California the range was from 1 to 10 periods a week. For the most part, general science was given in the ninth grade. All the schools except three Iowa cities were giving laboratory work, field work, or combinations of laboratory and field work.[35]

In a more recent report on general science in Iowa high schools, Lewis found that 28 per cent of the total number of schools in that state were offering the subject, and that 15 per cent contemplate introducing it soon. Seventy-seven of the 100 schools offering

[35] Taylor, A. M. General science situation in Iowa and California. *Sch. Rev.*, 24: 1916, 20-25.

general science introduced it in 1915-16. In 90 schools the course was one semester in length.

From his figures Lewis concluded that "in a majority of cases there has been a marked displacement of other subjects. This displacement has affected physical geography, botany, and zoology rather seriously." Replies "show very clearly that general science at present is a ninth grade subject in Iowa high schools; in but four schools has any attempt been made to teach the subject in the eighth grade. In but one school is the subject taught in the tenth year." Twenty-five schools either failed to answer or frankly say that they do not have laboratory work in connection with general science; 23 schools reported only a very small amount, usually given for demonstration purposes in class.[35a]

Foreign Language. The foreign languages advocated for the junior high school fall into two groups: ancient language, or Latin; and modern languages, or German, French, Spanish, etc. The aims that should govern instruction are largely the same. The advocates of both groups take the position that the pupil should become familiar with the fundamental principles of the language; he should improve in his ability to use English, should develop an interest in the life of the nation whose language is being studied and appreciate its influence on his own nation, and should develop attitudes and habits of mental industry. The aims differ in one particular. In the study of modern language the pupil should acquire the ability to use the language to some extent in speaking or writing.

A close resemblance obtains in methods of instruction. Both groups would begin with words and simple sentences about familiar objects, following this by the introduction of simple, interesting stories. Only occasionally is the mastery of conjugation and declensions advocated as an end; on the contrary, as little grammar should be given as possible, especially at first, and form should never precede actual use. As the course proceeds, more emphasis is placed upon verb or noun endings. Since the seventh or eighth-grade child cannot be expected to appreciate literary style or mas-

[35a] Lewis, E. E. General science in Iowa high schools. *Sch. Rev.*, 24: 1916, 426-435.

terpieces of literature, texts of this kind are being excluded, and tales of folk-lore, description and travel are finding a place in their stead. There is no general consensus that the direct method should be exclusively used in teaching either Latin or a modern language, but there is a consensus of opinion that a combination of conversational and text-book methods will give the best results. Both ancient and modern-language theorists emphasize the value of reading.

A difference in method does exist, however, and to a degree dependent upon the amount of stress placed upon the acquisition of a reading and speaking knowledge of the language. In Latin more emphasis is given to English derivatives; while in modern foreign language correct pronunciation is stressed. Since ill-formed habits cause loss of time, it is necessary that the pupil acquire phonetic accuracy from the beginning. Moreover, the vocal organs are more plastic at this age, and the other interests of school and life are not so urgent. Therefore, great care should be taken to insure correct pronunciation from the beginning. It will aid in accomplishing this end to give frequent individual and class drill in pronunciation, dictation exercises, and songs, poems, and short stories to be memorized.

In actual practice, marked preference is shown for Latin and German, although no reason is given for this preference. Miss F. L. Stuart, in the 1914 High-School Conference of the University of Illinois, urged that more attention be given to Spanish, that all claims made for German or French could be made equally well for Spanish, while the latter language possesses practical advantages far surpassing the former. The need for Spanish is being recognized by many colleges; while the evening schools in various cities, Y. M. C. A. schools, etc., spend much more time upon it than formerly. This is in recognition of the fact that, if the United States is to compete with European countries, men able to converse with the people of Latin-American countries in their own language and who understand Latin ideals must represent the commercial interests of this country.[36]

[36] Stuart, F. L. The demand for Spanish. Univ. of Ill. Sch. of Educ. Bull. No. 13, 1914. 264-268.

In the California intermediate schools the study of Latin seems to be very successful. The text-books in common usage are a Latin primer and a Latin first-reader, written by Professor H. C. Nutting, of the University of California, and designed especially for the intermediate school. About a year and a half is devoted to the primer and a half-year to the reader. In the ninth year Caesar is commonly read. Very little work is done outside of the class in the seventh year, but the amount is gradually increased during the next two years. Much work is done in concert; blackboard vocabularies are stressed; drills are frequently given, and the oral translation of English into Latin is emphasized. Interest is appealed to by employing the class in some activity demanding the use of Latin. The opinion among the Latin teachers was that "at that age they [the pupils] memorize very readily, but unless there is much, very much repetition, what has been so quickly learned is quickly lost. They are free from self-consciousness, and are full of eager interest in their work. On the other hand, the reasoning powers are not so fully developed, and grammatical constructions must be presented very simply and very slowly to be understood." Pupils who had had the intermediate-school training were better prepared for the more advanced Latin than those who had studied one year of Latin in the ninth grade.*

Hygiene. Relatively little junior-high-school literature deals with physiology, hygiene, or physical training; and only in a few curricula is health given a place equal in importance to other subjects. It has been conceded that the teaching of physiology in the past has been almost a failure, probably because instruction has been negative rather than positive and because time has been spent on anatomy and physiology rather than habit-formation. At present, however, there is not the concerted effort to work out courses in hygiene as in the other school subjects.

Burnham holds the fundamental aim in teaching hygiene should be the inculcation of habits necessary for health. Knowl-

*Nutting, H. C. Latin in the seventh and eighth grades in California. *Classical Weekly*, 7: 1914, 154-157.

Deutsch, M. E. Latin instruction in California intermediate schools. *Classical Weekly*, 8: 1915, 122-125.

edge of laws of health, anatomy, and physical development are necessary as they aid in forming these habits of useful activity, but actual training in hygiene is the essential thing. Storey believes that in the grades emphasis should be placed upon physical exercises, bathing, tooth-brush drills, the part the child plays in medical and physical examinations, school sanitation, etc., as procedures tending to develop habits of hygienic living. He would correlate this work closely with the advancing grades and vary it as needed with regard to content, presenting enough physiology and anatomy to insure an intelligent knowledge of hygiene.[87] Burnham outlines a course for teachers, in order that such a program may be carried out. The chief topics in his outline are: Personal hygiene, contributing to the efficiency of the teacher as a worker; public hygiene, furnishing a means of showing the conditions that favor the welfare of society; hygiene of the child, imparting a knowledge of the character of the child's body and the laws of its growth; school hygiene, dealing with the conditions of the school room and the sanitation of the school surroundings; mental hygiene and hygiene of instruction, furnishing a basis for method in instruction.[88]

Commercial Subjects. Less unanimity exists in the discussions of the commercial subjects than in the treatment of the so-called academic subjects. Some would exclude entirely from the seventh and eighth grades such subjects as stenography and typewriting, because they possess relatively little educational value; others assert they have proved their educational worth and are entitled to their place. Some formulate the ends of the commercial curriculum in terms of the English, arithmetic, etc., that the business man would expect of the eighth-grader if he were to leave school and go to work; others, while they would teach practically every subject in the commercial curriculum from the standpoint of business, would put educational values foremost; and still others would use the commercial courses as a field wherein the pupil might gain prevocational insight. On the whole, there seems to be

[87] Storey, T. A. Teaching of hygiene. Monroe's Cyc. of Educ., pp. 357-360. Personal hygiene, pp. 354-355. School hygiene, pp. 355-357.

[88] Burnham, W. H. Hygiene. Monroe's *Cyc. of Educ.*, pp. 353-4.

a pronounced tendency to make the commercial curriculum primarily vocational first, and secondarily prevocational or educative. In discussing this curriculum, as in the manual arts, it is frequently pointed out that one aim should be to give a certain amount of training to those pupils who will be forced to leave school at an early age. On the other hand, it is objected that this class of pupils cannot well be selected and segregated. Moreover, all the courses in the program should be as nearly equal in educational value as possible, for, if the vocational aspect is emphasized, pupils will be unable to transfer to another curriculum without the loss of time. Again, it is objected that the commercial curriculum is necessarily narrower than one including manual arts, academic subjects, and commerce. The answer is that this may be remedied by allowing commercial pupils the privilege of election from manual arts and academic subjects.

Home Economics. Since practically all girls are potential home-makers, "it is the purpose of this group of courses offered under household arts not only to prepare girls to become better home-makers, but also to make them more intelligent concerning those occupations which were formerly a part of every home but have recently been taken from the home, and to give them an appreciation of the factors that make up the municipal environment, and of the influence of these on the home."[39] The courses themselves fall into three groups: sewing, cooking, and home-planning and decoration. While considerable skill should be gained in actual manipulative processes, still the work should be directed to the broader, more educational end. Outlines of courses in sewing usually begin with simpler processes, as the making of stitches and simple pieces of clothing, and proceed to machine work, study of textiles, history and economic value of textiles, the relation of clothing to income, care and hygiene of clothing, beauty and becomingness of clothing, and the like. In the same way, courses in foods begin by the preparation of standard dishes, but proceed to balanced meals, foods for children or invalids, economic value of foods, chemistry of foods, and perhaps the hygiene of digestion. In both courses, stress is placed upon practical work and the rela-

[39] U. S. Bur. of Educ. Bull. No. 41, 1913. p. 58.

tion of income to the amount expended for clothing and food; and upon actual rather than 'black-board' buying. Occasionally, in connection with these courses reference is made to the care of children, and still less occasionally to the more direct phases of motherhood. Courses in home-planning and decorating are not so well worked out.

Industrial Arts. All agree that, beginning with the seventh school year, vocational guidance must be given to most, if not to all pupils. Much work has been done, and methods are crystallizing for the promotion of prevocational education, as distinct from trade training.

Studies show that the average twelve-year-old pupil has very incomplete ideas of his future, as well as a very inaccurate conception of the different industrial fields. If he has made any choice as to his future occupation, it is usually because of association, imitation of a friend, or a desire to emulate an adult whom he admires.[40] Even at the age of fifteen or sixteen only about half have selected a vocation, while of those who have done so, few are able to give intelligent reasons for their choice and still fewer have correct conceptions of the occupations they have selected. However, the interest in surrounding activities, blended with the more or less vague conviction that an occupation must sometime be chosen, is an aid in vocational guidance. Student questionnaires and other such devices help in bringing the pupil to consider his future. Natural ability shown in different lines of school work is taken as a primary consideration in giving vocational guidance.

The Committee on the Economy of Time in Education has outlined vocational education for the schools in a broad way[41] and many of its suggestions have been more or less deliberately followed by many school superintendents. The plan is: At the end of the six-year elementary school there should be provided "lower" vocational institutions, which begin training that will not develop productiveness or specialization in a narrower sense, but that will

[40] Bloomfield, M. (Editor). *Readings in vocational guidance.* 1915, 723 pp. Contains many studies along this line.

[41] *U. S. Bur. of Educ. Bull. No. 38,* 1913. p. 32.

give a vocational training standing in the same relation to later specialization or apprenticeship as the tools of learning acquired in the first six grades do to the later high-school or college years. Beginning with the senior high school, or at about the fifteenth year, a somewhat more specialized training dealing especially with those occupations midway between the trades and professions should be given. The graduates of these schools are not yet finished workmen or tradesmen, but continue through the university; or if they should stop school at this point, they would enter upon a new, shortened, and school-supervised apprenticeship. The argument for a school-supervised apprenticeship is that proper training will not be given by a manufacturing plant, trade union, or a foreman, who cares nothing for the development of the young apprentice.

The inference may be drawn that the general theory held by those outlining junior-high-school work is in the main as follows: Pupils in the seventh and eighth grades should pursue the fundamental branches as the chief divisions of the curriculum in classes where but little differentiation is made with reference to the particular vocational courses, but where class work is vitalized through industrial work as well as other social applications. In addition to its educational aim, the vocational course should aim to determine the pupil's natural aptitude in some particular line and to discover any pronounced lack of ability. Any curriculum must be elastic enough to allow changes from one line to another, without the loss of time, until the best possible opportunity for success is discovered. As a consequence, the prevocational lines now being formulated are: the academic, offering languages; the commercial, offering the beginnings of a business education; and the industrial, which usually consists of wood and metal work, agriculture and domestic science. The academic and commercial are usually more general than the industrial curricula, since the latter are built more directly upon the occupations of local communities.

Several other well-marked tendencies of vocational education in the present-day reorganization are to be noted. One is the disposition to make provision for a class of pupils who intend to end

their schooling with approximately the eighth year, and who desire to secure training that will fit them for productive work. Courses, usually two years in length and designed to give a rather specific vocational training, are offered for these pupils. In some instances this is reinforced by a "part-time" or a "follow-up" system.

A second tendency is to vitalize the different courses and at the same time make them prevocational by correlating them with the social and industrial activities of the community.[42] Principal J. B. Davis of Grand Rapids, Michigan, has evolved a plan of vocational guidance which is in operation in his school, and variations of which are found in a number of places. It is carried on through the English courses. Beginning with the seventh grade, studies are made of the occupations. For this work, trips are taken to different industrial establishments, books and magazines are supplied, and the pupil is encouraged to find from any source whatever he can about the vocation he is studying. An attempt is made also to lead the pupil to consider his own fitness for a calling, while data taken by the vocational adviser help him to understand the child's inclinations. The procedure is made more definite with the succeeding grades, and the discovered aptitudes are taken into consideration to some extent in assigning individual work in the other classes.[43]

There is also a tendency to carry the prevocational lines of the earlier grades into the senior high school where they are to be differentiated further, made more specific, and articulated directly with the industries and the professions, as the college-preparatory course has been articulated with the colleges in the past. This conception leaves out the "school-supervised apprenticeship" recommended by the Committee on the Economy of Time; it makes the senior high school more vocational than it would be otherwise; and it makes necessary at least a selection of a general type of vocation at the end of the ninth school year.

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[42] See Dewey, J., and Dewey, E. *Schools of tomorrow.* 1915, 316 pp. Taylor, J. S. Report on Gary schools. *Educ. Rev.*, 49: 1915. 510-526.

[43] Davis, J. B. *Vocational and moral guidance.* 1914. 303 pp.

In a questionnaire study of manual and household arts in the elementary and secondary schools of 156 cities, including 39 states, Park and Harlan found one-half reported the prevocational aim as dominant in their teaching. They also found a wide range of variation in the kinds and the grade-location of the work offered. The central tendencies show one period a week of 70 to 90 minutes in the grade and 5 periods of about 75 minutes in the high schools. They found about 5 per cent of the total school time utilized in the first 6 grades, about 6 per cent in the seventh and eighth, and nearly 25 per cent in the high school. They found a further tendency to adapt methods to the age and grade. Seventeen per cent used systematic graded exercises, individual projects by the pupils, co-operative projects selected by the group, and projects expressive of some phase of work in arithmetic, history, literature or other subjects. Other combinations were used frequently, but the combination of systematic graded exercises with individual projects was used in 23 per cent of the cases. They found a strong tendency towards individual work, since 40 per cent of the cities allow the pupils to keep the products of their handiwork. The tendency to dispose of such products by sale was almost negligible.[44]

A number of recent studies have been undertaken to determine the extent and scope of manual and domestic arts. Bennett's questionnaire sent to 196 school systems showed 24 giving 2.5 or more hours to manual arts in the seventh grade; 45 cities, 2.5 or more hours in the eighth; 46 cities, 5 or more hours in the ninth. Of 1,336 smaller cities, 753 report courses in industrial arts. The Reading survey of 147 cities showed 42 different industrial-arts subjects given in the seventh grade. Elementary bench work, 100 schools; sewing, 81; cooking, 71; mechanical drawing, 53, were most frequently given. About the same situation was found in the eighth grade.

EXISTING JUNIOR-HIGH-SCHOOL CURRICULA

The following tables and charts summarize the curricula found in actual operation in 75 seventh and eighth grades, and in 31 ninth

[44] Park, J. C., and Harlan, C. L. Teaching of manual arts and home making in 156 cities in the United States. *Educ. Ad. and Super.*, 1: 1915, 677-678.

grades. All of these schools begin their junior division with the seventh grade. In a few cases a ninth grade was included when it did not form a part of the junior high school. This method of tabulation perhaps gives a better representation of present work than if schools were included regardless of grade grouping. It is probable, however, that the 31 ninth-grade curricula contain a greater proportion of the more progressive cities, and that, as a consequence, the ninth grades appear better than they would otherwise. In instances where two or more curricula are found in one school, subjects—as English, for example—occurring in each of the curricula were taken as required.

TABLE 6

CITIES WHOSE SEVENTH, EIGHTH, AND NINTH-GRADE CURRICULA ARE INCLUDED IN THIS SUMMARY

Berkeley, Cal.	Chanute, Kan.	Santa Fe, N. M.
Los Angeles	Hays	Trenton, N. J.
Oakland	Neodesha	Horace Mann, (N. Y.)
Santa Rosa	Adrian, Mich.	Columbus, O.
Norwalk, Conn.	Grand Rapids	Muskogee, Ok.
Quincy, Ill.	Lowell	Salem, Ore.
Springfield	Cokato, Minn.	Curwensville, Pa.
East Chicago, Ind.	Crookston	Murray, Utah.
Seymour	Duluth	Salt Lake City
Goldfield, Ia.	Rochester	Bristol, Va.
	Wisconsin High School (Madison)	

CITIES WHOSE SEVENTH AND EIGHTH-GRADE CURRICULA ARE INCLUDED IN THIS SUMMARY

Fresno, Cal.	Ft. Scott, Kan.	Silver Creek, N. Y.
San Francisco	Girard	Solvay
Ft. Morgan, Col.	Manhattan	Bismark, N. D.
New Britain, Conn.	Madisonville, Ky.	Devil's Lake
Boise, Idaho.	Morganfield	Grafton
Lewiston	Paducah	Webster
Crawfordsville, Ind.	Arlington, Mass.	New Kensington, Pa.
Evansville	Dudley	Brookings, S. D.
Mt. Vernon	Kalamazoo, Mich.	Columbia, Tenn.
Richmond	Faribault, Minn.	San Antonio, Tex.
Denison, Ia.	Hutchinson	Ogden, Utah
Hampton	Lincoln, Neb.	Burlington, Vt.
Winfield	Brockport, N. Y.	Diamondville, Wyo.
Arkansas City, Kan.	Dansville	Laramie (U. of W.)
Great Bend	Scotia	

Tables 6 and 7 present a number of interesting points. A wide range of subjects is found, as well as a wide range of grouping of subject matter. In English, for example, some schools have courses well organized under the head of "English," with grammar, penmanship, spelling, etc., closely coördinated; others have courses appearing upon close examination to consist of reading or

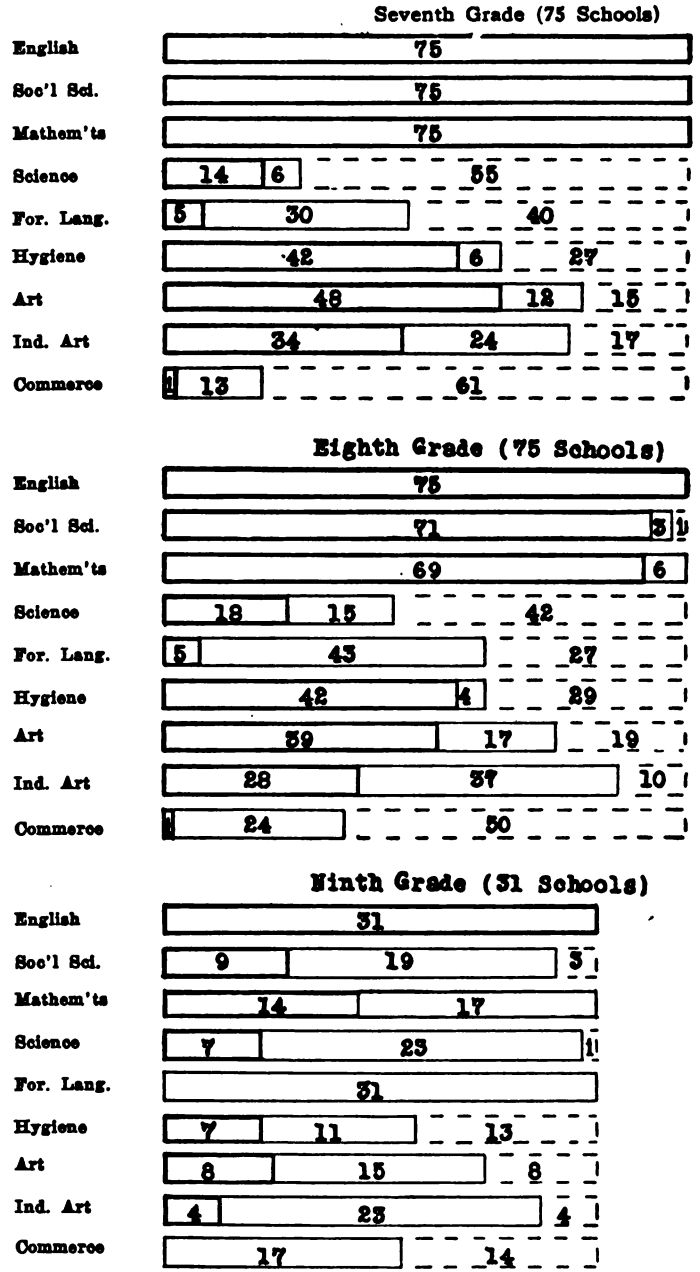

CHART 1.

CHART 1. GRAPHIC REPRESENTATION OF THE DATA IN TABLE 7.

The heavy line denotes that the subject is required, the light line that it is elective, and the broken line that it is not given. The number of schools is indicated.

TABLE 7

EXISTING JUNIOR-HIGH-SCHOOL CURRICULA, SHOWING THE SUBJECTS OFFERED; AND THE NUMBER OF SCHOOLS OFFERING EACH SUBJECT

		ENGLISH						SOCIAL SCIENCES							MATH'CS			SCIENCES				LANGUAGES					
	No. of Schools	English	Reading	Grammar	Spelling	Penmanship	English (Gr. Sp.Pen.)	History	Civics	Hist. & Civ.	Geography	Hist. & Geog.	Hist., Civ., & Geog.	Civics & Geog.	Mathematics	Algebra	Arithmetic	General Science	Agriculture	Physiography	Biol. (Bot. & Zoo.)	Latin	German	Spanish	French	Swedish	Italian
Seventh Grade Required	75	53	17	19	31	35	14	51	8	4	51	7	1	2	10	1	65	11	..	4	..	1	..	1	..	..	..
Elective	..	..	7	..	..	3	..	..	..	..	3	..	..	..	..	..	..	4	2	..	..	15	23	6	9	1	1
Eighth Grade Required	75	57	13	15	25	25	12	51	17	14	17	5	1	..	12	..	49	13	4	1	..	1	3	1	..	..	..
Elective	..	8	..	3	..	3	1	1	4	1	1	..	..	..	1	..	1	10	7	..	..	27	32	3	9	1	1
Ninth Grade Required	81	81	..	2	1	..	..	4	3	1	1	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..
Elective	..	2	..	..	3	7	..	16	1	1	1	..	..	..	3	12	2	12	3	5	3	26	26	5	5	1	1

TABLE 7—Continued

		HYGIENE			ART				INDUSTRIAL ARTS										COMMERCE						
	No. of Schools	Physiology	Hygiene	Physical Training	Fine Arts	Music	Drawing	Freehand Drawing	Industrial Arts	Manual Training	Survey of Vocations	Industrial Science	Industrial History	Printing	Metal Work	Domestic Science & Art	Interior Decoration	Dressmaking	Design	Mechanical Drawing	Typewriting	Com. or Ind. Arith.	Com. or Ind. Geog.	Shorthand	Business Practice	Commercial English	Bookkeeping	Commercial Law
Seventh Grade Required	75	13	13	26	5	45	31	2	4	30	..	..	..	..	..	30	..	..	..	1	..	..	4	..	..	..	..	..
Elective	..	1	..	3	6	10	10	..	4	23	..	2	..	2	..	24	1	..	..	3	3	2	1	..	1	..	7	..
Eighth Grade Required	75	15	11	26	6	35	13	2	3	25	..	..	..	..	..	25	..	..	..	..	..	5	3	..	..	1	1	..
Elective	..	3	2	4	7	19	13	..	4	32	..	..	2	2	1	32	1	..	1	6	10	..	1	4	1	..	14	..
Ninth Grade Required	81	2	1	10	1	5	4	..	..	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..
Elective	..	3	1	3	2	14	6	6	5	19	1	..	1	2	..	19	1	1	..	8	6	11	5	5	..	..	9	2

literature, two periods a week; grammar, two periods a week, and a period of penmanship and spelling—these sectionalized and presented in a wholly separated fashion. Others have made no attempt to unify English. The same may be said of the subjects grouped under the caption "Social Science," or "Mathematics." Among the foreign languages, German and Latin hold sway. In the seventh grade 35 of the 75 schools offer foreign language. Of these 35, one offers Latin alone; 15 offer German alone; and 6 offer both Latin and German, thus accounting for all but 13 of the schools. In the eighth grade of the 42 schools offering languages 4 offer only Latin; 3 give only German; and 18 permit a choice between the two.

In the seventh grade 34 schools offer no optional subjects; seven schools offer a choice between manual training or domestic science and a foreign language; and one offers domestic science or manual training as the only elective. In the eighth grade 25 schools offer no optional subject; 6 permit a choice between domestic science or manual training and a foreign language; 9 offer language as the only elective. In the ninth grade greater freedom of choice is given. Only one school offers no optional subject; three offer language alone; and one offers only a choice between language and manual training or domestic science.

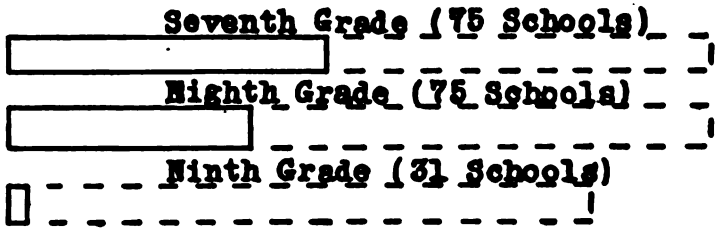

CHART 2

PROPORTION OF SCHOOLS OFFERING ELECTIVES (SOLID LINE) AND NOT OFFERING ELECTIVES (BROKEN LINE) IN THE 7TH, 8TH AND 9TH GRADES

According to these tables, the backbone of the curriculum for the first two junior-high-school years consists of English, social science, and mathematics. Real differentiation is not under way.

If the curricula from which the tables are compiled are representative, the average curriculum for the first year of the junior high school is: English (6 periods per week), with reading, writing, grammar, spelling and penmanship taught separately or in rather poor coördination under the general heading; social science (5), presented as history and geography; mathematics (5), meaning arithmetic; physiology and hygiene (3) or physical training (2); drawing (2) and perhaps music (2); manual training (2) or domestic science (2). For the second junior-high-school year the average curriculum is: English (5)—much the same as that in the first year; history (5) or civics (5); arithmetic (5); physiology and hygiene (3) or physical training (2); music (2) or drawing (2); and an option between Latin or German (5) and manual or domestic science (2).

Real differentiation is under way in the ninth grade. Here the only required subject is English, and options are allowed—under supervision—to the extent that the pupil practically selects his own work. He may choose among Latin and German, history, algebra, general sciences, music and drawing, manual or industrial arts and domestic science, and certain commercial subjects.

The greatest number of subjects is found in connection with industrial arts or prevocational work, and this number is increased by approximately 50 per cent when the commercial branches are added. This variation is to be expected when curriculum building is considered from the standpoint of community interest. The presence or absence of such subjects is, however, the only available index to what is being done in a school system with regard to vocational guidance, and thus considered, it is strikingly noticeable that a considerable percentage of the schools are making no provision whatever in this direction. Also, school reports and other literature show that these branches are taught with a variety of aims in view.

One question in our syllabus was: "Are your manual and household arts courses planned to help the student find his life's work, to fit for a trade, or for general educative value? Are these courses required?" Eighty-four replies are as follows: Eighteen plan their courses to "help the student find his life's work," 3 to

help find a life's work and to "fit for a trade," 17 to help find a life's work and for "general educative value," 31 for general educative value alone, while 15 have all these points more or less definitely in mind. "General educative value" to some superintendents might imply a certain amount of prevocational training, but in the light of the other points in the question it would seem that those who would "help the pupil find his life's work" as well as give him "general educative value" may be more properly credited with this latter conception. Of 73 replies, 31 require manual and domestic arts; 37 allow the pupil to choose, and 5 require one or two years of this work (See Appendix, Section 3).

Types of curricula. The different subjects and courses are grouped into curricula that vary from a curriculum representing a formalistic presentation of the old subject matter of the grammar school to a curriculum really made up of several different curricula in which subjects and courses are differentiated for groups of pupils. A classification is unsatisfactory on account of overlapping, but several types seem to be more general (For examples of these types see Appendix, Section 2).

1. One type is made up of the common branches with no elections until the ninth year, when a choice may be made among languages, industrial arts, and perhaps science. This type often contains no manual or domestic-arts courses.

2. A second curriculum is essentially the same as the first, save that manual training and domestic science are found throughout. Language may usually be begun in the eighth grade. Here also are feeble beginnings at a systematization of subject matter.

3. A third type consists mainly of the common branches, with languages, manual training or industrial arts and domestic arts, science, and commerce, but the subject matter is being subjugated to an overhauling, condensation and elimination of nonessentials, and is being correlated with the elementary school from below and with the senior high school from above. In varying degrees, also, subject matter is being given its social and economic setting. A few elections are given the first year; more opportunity for choice is given the second, while in the third year English is

about the only required subject. Under this general heading several sub-types are found:

(*a*) A general curriculum, in which the pupil elects such subjects as are not required of all. Sometimes statements are made to the effect that the pupil, the pupil's parents, and the principal or teachers coöperate in determining elections; frequently no such statement is made. Here elections seem to carry no further than the semester or year. This is a very common type.

It would seem that this plan offers a wide range for individual development through its adaptability to individual differences, and certainly an ample chance for adjustment in case of a wrong choice. On the other hand, it might be objected that it does not make adequate provision for continuity of effort.

(*b*) Another type combines the general-curriculum with the separate-curriculum plan. Except for more or less elective privileges in the seventh and eighth grades, work is the same for all; with the ninth grade, distinct curricula are provided, and these are carried into the senior high school. This seems to be a rudiment of the eight-four plan where differentiated work was provided beginning with the high school. It assumes that the ninth-grader has reached a place where he can choose more specialized work, and it aids him in his decision through elections during the two preceding years.

(*c*) A common type is divided into two or more curricula, such as the "regular academic," the "industrial," and the "commercial." Here subjects like English, arithmetic and history, are the same for all pupils, and the curriculum is often named from one or two subjects that differ from the common stock. The main difference between this and Type *a* seems to be that the pupil decides at the beginning what work he is to pursue for three years.

Without doubt this plan tends to reduce to a minimum the disadvantages of the elective system. It must assume, however, that no mistake has been made in selecting the courses to form a definite curriculum and that the pupil has chosen correctly. Sometimes provision is made for transfer, if it is shown that the pupil is clearly unfitted for the work he has chosen, but more often the pupil is given to understand that after the first year it will be

difficult for him to change. Rarely are electives provided within the curriculum. Lack of flexibility at the time when ability should be tested in a number of fields seems to be the greatest fault of this type.

(*d*) Another type is divided into two-year "cycles." To some extent options are given at the beginning of the seventh year, but the selection at this stage carries with it certain subjects or courses and perhaps another cycle as well. At the beginning of the ninth grade a second and even more important selection is demanded.

This method aims at giving the benefit of the elective system and at the same time to insure that continuity of effort which may be lacking in a curriculum consisting largely of free electives. Since a cycle contains a group of subjects, there should also be a closer coördination of work. The work is, however, relatively unchangeable for two years.

4. Another type provides several different curricula, in which subjects and courses are widely differentiated. Thus, English or arithmetic, varying but little from the traditional course, is provided for pupils who expect to complete the high school and to enter college; commercial or industrial English or arithmetic for pupils whose aptitudes seem to be for this kind of work or whose vocational destinations will probably be the commercial or industrial world. This scheme involves also segregation as to sex. The sexes may be handled together in certain "cultural" subjects, while in the industrial subjects they receive separate instruction. In accordance with this view, there is no call for segregation in the "academic" curriculum and but little reason for segregation in the "commercial" curriculum, excepting when these pupils take manual training, domestic science, physiology and physical training. However, the sexes are kept separate to the degree that science, history, mathematics and the like will differ when founded upon home-making on the one hand and upon industrial arts on the other. Others believe that segregation possesses value in itself.

This plan has been objected to on the ground that it provides a narrow training. A curriculum based entirely upon commercial

or industrial branches, it is said, can hardly have the breadth of one including these subjects as electives. Moreover, pupils in these different lines of work are liable not to acquire a sufficient amount of the knowledge that ought to be common to all. The plan is defended on the ground that it provides the best possible means for individual differences and that knowledge really essential may be presented just as easily in a commercial or industrial setting.

5. Whatever may be the general plan adopted, a number of superintendents are providing two- or three-year curricula for pupils who expect to leave school at the end of the eighth or ninth school-year, and who, as a consequence, desire training productive of immediate financial returns. This training is for the most part along commercial, industrial and home-making lines, and these lines are closely articulated with commerce, the industries and the home. It is realized that difficulty will arise in the planning of other work should a pupil desire to remain in school at the end of this time, and some are taking steps to remedy this trouble.

6. Gary has often been said to possess a junior high school, not because of outward features of organization, but because of the educational principles upon which the system is founded. To Taylor, it is the most significant educational experiment since Pestalozzi; to Snedden, its plan of practical instruction is better "than anything heretofore existing outside of individual schools;" to Burris, it is the "best yet devised." The community idea and the social working groups of pupils are to Dewey the "biggest idea." The maximal use of the school plant, play activities, duplicate school system, have been widely studied and imitated. The copious literature on Gary is for the most part highly laudatory.

7. In the course of the junior-high-school reorganization into prevocational departments, fragments have split off—the industrial arts department withdrawing to form a separate elementary industrial or prevocational school. But, though narrowed to the industries, these schools still possess striking vocational guidance functions. In some localities schools are provided for 'motor-minded' students; in others, all students are given this work

Leavitt and Brown in their recent book[45] are concerned chiefly with schools for the type of pupil that does not succeed in the traditional work, although they do not seem convinced that all pupils could not pursue more vocational work with profit.

One of the most consistent attempts to develop this type of school is the Ettinger prevocational experiment in New York. Under the Ettinger plan, children at the beginning of the seventh grade, having chosen between regular academic and industrial work, are divided into sections for wood-work, machine-making, millinery, pasting novelty work, power-machine operating, etc. The admitted purpose is vocational guidance, by "rotating industrial classes," with nine weeks in each shop, then shifting, until marked aptitude is shown; marked deficiency, on the other hand, results in a return to academic work until the next shift.[46]

Albany and Rochester have industrial courses for normal pupils. Rochester has three boys' industrial and girls' household-arts centers, with prevocational experiences in wood-work, metal work, masonry and industrial drawing, cooking, sewing, applied art and design. But the Cleveland elementary industrial school, for example, is limited to retarded children. This school develops a course of study parallel to grades seven and eight, devoting half-time to practical arts, and reducing the amount of allotted book subjects two-fifths. Vocational guidance is secured through the general course in which the boys work before specializing definitely for the major art of the second year. In Indianapolis, while semi-industrial schools parallel grades seven and eight, the new course has also been placed in some elementary schools, with freedom of transfer, for all seventh and eighth-grade children. The range of prevocational experiences here includes "carpentry, joinery, repair work, art metal-work, printing and book-binding, sewing, dress-making, art needle-work, weaving, cooking and housekeeping."

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[45] Leavitt, F. M., and Brown, E. *Prevocational education in the public schools.* 1915, 245 pp.

[46] Ettinger, W. L. A report on the organization and extension of prevocational training in elementary schools. Dept. of Educ., New York City. 1915, 80 pp.

Weet, H. S. A first step in establishing the six-three-three plan. *N. E. A. Bull.* No. 6, 4: 1916, 146-152. Published also in *Educ. Ad. and Super.*, 2: 1916, 433-447.

CHAPTER IV

PROBLEMS OF ADMINISTRATION AND SUPERVISION IN THE JUNIOR HIGH SCHOOL

THE GROUPING OF GRADES

The present grouping of grades is first of all dependent upon local conditions, particularly upon building facilities. Outside of a few schools that have been governed largely by the previous arrangement of grade, there seems to be a consensus of opinion that the seventh grade is the place to begin the junior high school. A large majority of the school systems in which the junior high school has been established use either a six-two-four, a six-six, a six-three-three or six-four-two grouping (see Table 8).

TABLE 8

THE PRESENT GROUPING OF JUNIOR-HIGH-SCHOOL GRADES IN 184 SCHOOL SYSTEMS

Grades	5–7	5–8	6–7	6–8	7–8	7–9	6–8	8	9	8–9	7–10
Number of Systems	1	1	1	11	77	64	10	3	1	8	7

Of 22 additional schools that will reorganize later, 16 expect to include grades 7-9 in the junior high school. A few New England schools having nine grades plus a four years' high school are arranging to eliminate one year. On the other hand, a few cities in the south, where the seven-year elementary school is common, report that they have formulated a system calling for six years' elementary and six years' high-school work.

The six-two-four method seems to be an outgrowth of the eight-grade grammar school and is found very often, though not always, in the same building with the first six grades. Its frequency may be partially explained by the lack of organization and correlation of subject-matter, since a number of superintendents who use this plan are expecting to add the ninth grade as well. In this case it may be looked upon rather as a stage of development,

although it is probable, even with this conception, that the seventh and eighth grades will comprise the junior-high-school unit in some cities for some time to come. On the other hand, if differentiation of courses should come with the ninth grade, as it now does in some schools, or if the ninth grade should be regarded as the proper time to end general education and to begin closer specialization in ordinary school work or in trade training, the result might well be a junior high school composed of grades seven and eight.

Snedden's view seems to be somewhat of this nature, although he believes in optional subjects beginning with the seventh grade. At the Detroit meeting of the N. E. A. he advocated electives for children from twelve to *fourteen* years of age—which undoubtedly means he believes that a different kind of education should be provided for these children, and also apparently that general education is to stop with the eighth grade.[1] Snedden's well-known views upon vocational training further confirm this interpretation of his views.

Small school systems with an insufficient number of pupils to warrant a junior, as distinct from a senior high school are frequently organized on the six-six basis, or, if they have the six-three-three or six-two-four organization, the difference is usually so slight that it amounts to the same thing. However, Grand Rapids, Mich., is a notable example of a large city preferring the six-six type. In this type some see peculiar advantages, especially the separation of the twelve years into six years of elementary and six years of secondary work. Also, it probably reduces to the minimum the chance of a 'gap' arising between the junior and senior schools, as in the past between the eighth and ninth grades, since there will be a closer coördination of subject matter and at no time will a pupil feel that he has completed a definite division of the school.

A division consisting of the seventh, eighth, and ninth grades has perhaps more advocates than any other. These three grades, it is said, "belong together" for psychological reasons, for the average child enters the seventh grade at the beginning of the

[1]Snedden, D. The character and extent of desirable flexibility as to courses of instruction and training for youths of from 12 to 14 years of age. *Educ. Ad. and Super.*, 2: 1916, 219-234.

adolescent period and emerges from the ninth grade with the period of transition completed. Hence, such an arrangement permits the handling of a group of pupils psychologically similar, who form a homogeneous social group. Also, this plan should aid in retaining pupils in school, for it will tide them over the critical period when the compulsory attendance law permits them to withdraw.

In a few sections of the country the conviction is growing that grades seven to ten should constitute the unit. Here the idea is to make the period of "general education" extend through the tenth school year, while with the eleventh, real secondary training, more specialized in nature, begins. This view distinctly holds that four years is necessary for general education, and perhaps implies but little less distinctly that the eleventh and twelfth years of the high school and the first two years of college will be embodied within the period of "secondary education." Merrill, for example, argues for such a division, and points out that the place where stress is rightly shifted from the individual to subject matter constitutes the place to separate "intermediate" from high-school instruction. Such a place, in his opinion, lies at the end of the tenth school year.[2] Again, Miss T. M. Otto, in considering this question from the standpoint of girls, asks for a period of four years to give the girl a thorough general training. She also says:

> Many leading educators are agreed upon the need of a unified period of four years following the sixth grade—a period which should be organized solely for the best interests of the pupil. James P. Haney, Director of Art, High Schools, New York City, insists that this new type of education should consider not only the so-called 'waste years,' between 14 and 16 years of age, but should cover a period of four years. Arthur D. Dean, Chief Division of Trades Schools, New York, also advocates a four-year period as the length of time after the sixth grade necessary to produce the requisite mental and physical training for a life of efficiency, and as necessary to attract and hold the pupil from 14 to 16 years of age, when growing power is greatest and earning power is least. Dr. Balliet favors a type of 'Intermediate industrial school' covering in point of time, the first two

[2] Merril, G. A. The province of the intermediate school, the province of the high school, and where to draw the line between them. *Proc. Cal. Teach. Assn.*, Berkeley, 1914, 9-16.

years of the elementary course and the first two years of the high-school course.[8]

A division ending with the eighth, the ninth, or the tenth school year presents another point for consideration. A course of study at the beginning of the senior high school would probably differ from the same course as marking the end of a more or less definite cycle of work, even in those schools where it is hoped the line of demarcation between the junior and senior schools will be little noticed. If it is probable that the compulsory age limit will be pushed upward to the age of sixteen, and if it is true that an increasingly large number of pupils will remain in school until this age, whatever the compulsory age limit, we have additional reasons for a period ending with the tenth school year.

THE 'REGIONAL' SCHOOL

In the recent survey of education in Vermont, the commission advised the smaller high schools, which maintain a four-year high school curriculum with great difficulty and expense, to give up the last two years and consolidate the seventh and eighth grades and the first two years of the high school "into a compact, closely articulated school unit, to be known possibly, as a junior or intermediate high school." A central school could then be organized in a sufficiently large district, open to, and designed for, the needs of the entire district. Its curriculum up through the junior school would be adapted to the needs of the immediate locality, while the same would be true of other schools in the district. This "course [in the junior high school] should represent acquirement and training of recognized value to such pupils as may receive no further education. Moreover, this value must be such as can be appreciated by the average parent, and to no slight degree by the pupil himself. Second, the curriculum should be based predominantly upon the environment and find its points of departure and return in the community activities and needs. Third, the course must fit

[8] Otto, T. M. Making over the middle years of our school system to meet the needs of girls. Paper read before the high school section of the Cal. Teach. Assn., Dec. 27, 1911. 11 pp.

in with the central school, through which the avenue to higher education must be kept open."[4]

Judging from indications, it seems that a plan of this sort may be followed by localities in other states.

HOUSING

Existing building conditions are the prime determiner of the housing of the junior high school; and the same factor often determines whether or not the junior high school has its own principal. Of 178 schools, 45 are housed alone, 59 with the senior high school, 63 with the elementary grades, 2 in annexes to the senior high school, and in 9 systems some of the junior high schools are housed alone and the remainder with other grades. Of 172 junior high schools, 88 have their own principal, whether they are alone or with other grades, 81 do not have their own principal, and three are administered by an assistant who is under a principal of high schools. Nine of 11 additional schools that are to be reorganized will be separate and will have their own principal.

Many of the larger cities prefer a separate building[5]—a plan that facilitates administration and organization of junior social activities, and gives advantages in providing shops and laboratories. Smaller cities are not making the effort to provide separate quarters for this division of the system.

Oakland, Cal., has one district junior high school, and another school that has grades six to ten, inclusive. Besides these, there are four large elementary schools in which the work of the seventh and eighth grades is organized on the junior plan. The latter schools have given such satisfaction thus far that the intention now is gradually to reorganize all the larger elementary schools on this plan. Evansville, Ind., has the last six grades in one large plant, and this arrangement has proved advantageous. It allows one teacher to work in any of the grades and it reduces the feeling on the part of the pupils that there is any real division between the junior and the senior school. Rochester, Minn., is an example of

[4] Learned, W. S. The secondary schools. In *A study of Education in Vermont*. Carnegie Foundation, 1913, 61-110; p. 100.

[5] See Proc. N. E. A., 1914, 276-277.

this same grouping, but the superintendent there is convinced that the plan would work out more successfully if the two schools were separated.

COLLEGIATE INSTITUTIONS AND THE JUNIOR HIGH SCHOOL

One question in our syllabus was devised to find out whether in the opinion of superintendents the institutions of higher learning favored the junior-high-school organization. Only about 40 per cent answered this question. Of a total of 60 replies, 22 give an affirmative, or say that as far as they have learned, these institutions are favorable; four say that some of the colleges are favorable and some are not; three that the professors of education favor it; and 22 say either that they do not know or that no opinion has been expressed. Thirty-five replies to letters addressed to normal schools and to professors of education in colleges and universities in the states where the junior high school has obtained the firmest foothold seem to show that the average normal school or college is watching the development with interest but that no close relation exists between the public-school men and the departments of education of the collegiate institutions. Several colleges anticipate a demand from the secondary schools for teacher-training facilities and for advanced credit due to the economy-of-time feature, and say that they stand ready to meet these demands when they arise. Columbia, Harvard and Pittsburg universities are offering special work on the junior high school; Chicago, Michigan, Illinois, and Wisconsin Universities in the Middle West, and Leland Stanford and the University of California in the West, are leaders in the junior-high-school movement, but outside of a relative few the colleges and universities are following, not leading the developments. State departments of education show the same tendency. New Jersey, New Hampshire, California, Wisconsin, Tennessee, and New York have given encouragement and advice from the beginning; others have begun to study the junior high school since they have seen it taking hold in their public schools, while others have been ignorant of the fact that several schools in their state had already been reorganized. Some state departments have not

pushed the junior high school because of some other scheme of organization which they thought better suited to the schools of their state.

PARENTS, TEACHERS AND PUPILS

Superintendents are practically unanimous in declaring that the junior high school has increased the interest of pupils, teachers and patrons. To further this interest, parent-teacher associations are being formed in many places. Several superintendents have used the questionnaire method to find how the patrons and pupils regard the junior high school.

THE JUNIOR COLLEGE[6]

Already the junior college seems to be in a stage of development parallel to that of the junior high school only a few years ago. The following cities have either adopted the junior college or have it under consideration. No attempt has been made to collect names of cities outside of those to which the junior-high-school questionnaire was sent:

TABLE 9

PROGRESS OF THE JUNIOR COLLEGE MOVEMENT

Cities having Junior Colleges:

Anaheim, Cal., 2 yrs.	Evansville, Ind., 2 yrs.
Fresno, Cal., 2 yrs.	Grand Rapids, Mich., 2 yrs.
Los Angeles, 2 yrs.	Muskogee, Okla., 1 yr.
Aurora, Ill., 1 yr.	Columbia, Tenn., 1 yr.
East Chicago, Ind., 1 yr.	

Considering the Junior College:

Quincy, Ill.	Paducah, Ky.
Crawfordsville, Ind.	Dudley, Mass.
Evansville, Ind.	Austin, Minn.
Gas City, Ind.	Devil's Lake, N. D.
Goldfield, Ia.	Curwensville, Pa.
Radcliffe, Ia.	North Troy, Vt.
Neodesha, Kan.	Kemmerer, Wyo.
Winfield, Kan.	

Bingaman, in a recent report, gives additional information regarding the extent of the junior college. In operation: Auburn, Bakersfield, Fullerton, Long Beach, Santa Monica, Cal.; Rochester, Minn.; Hannibal, Mo.; Dansville, N. Y.; Lake View, Ore.; Sumner, Wash. Expect to organize later: Dundee, Ill.; Muncie, West Lafayette, Ind.; Fredonia, Kan.; Barnesville,

[6] A number of references to the junior college will be found in the bibliography.

Fergus Falls, Mankato, Montevideo, Minn.; Cando, Grafton, La Mourne, Williston, N. D.; Dayton, O.; Medford, The Dalles, Ore.; Johnstown, New Kensington, Pa.; San Antonio, Tex.; Rawlins, Wyo. (Bingaman, C. C. A report on the intermediate or junior high schools of the United States. Goldfield, Ia., 1916. p. 63.)

It has been advocated at La Crosse, and will probably be put in operation when the colleges and universities give credit for work done. Detroit would have one, if it were not against the law. Bismark is arranging to offer the first year. Worcester, Chanute, Kan., Trenton, Faribault, Minn., and Fort Morgan, Colo., reply "not at present," and Concord is favorably disposed towards it. Sixty-two schools reply that they do not have the junior college and do not intend to establish it.

Leland Stanford and the University of California favor the junior college, and are recognizing the work done in the junior colleges in that state. Oklahoma University makes a like provision for the work done in the Muskogee school system. At the University of Illinois, certain specifications are made with reference to students admitted to the junior college, qualifications of instructors and their teaching schedule, organization of courses, and equipment. In places where these qualifications are "approximately met, substantially hour-for-hour credit will be given at the time of the student's admission to the university, provided the maximum credit allowed shall not exceed 18 hours per semester." Partial credit will be given if the requirements are partially met. In 1915, three high schools in Illinois—the Crane Technical High School of Chicago, the Lane Technical High School of Chicago, and Township High School at Joliet—had incorporated the first two college years and had approved and accepted the above standards and regulations.

As indicated by this investigation, the main difficulty with the junior college seems to be a tendency to offer only an additional two years of work similar to the academic course of the high schools. This will be of value to a certain class, but other classes of students need work more vocational in nature which will be more difficult to provide. According to indications, also, junior colleges will be established in places of lesser resources and school

population where an inferior quality of work will be done. This tendency, however, the entrance requirements of the colleges and universities may tend to correct.

THE SECURING OF TEACHERS

A problem of the greatest importance lies in securing teachers for the junior high school. As organization is completed and a demand for a definite type and preparation is made, the peculiar difficulty besetting the junior high school will doubtless tend to disappear. A type of teacher is needed that has some knowledge of child and of adolescent psychology, and that appreciates the true pedagogical value of subject matter—in other words, a teacher that has the "junior high school idea."

Today, superintendents are favoring teachers who have had a normal-school training, rounded out, if possible, by one or two years of collegiate work. Such a teacher seems to have a better conception of the stage of the child's life in which he enters the junior high school, the development these years gave him, and what it means to a pupil when he stops school or enters the senior high school. The present body of junior-high-school teachers is made up of elementary teachers who have been thought qualified for this work, and of high-school teachers—usually those who have been engaged in the first two years of high-school work—who have had experience in the grades and therefore appreciate the problems of the junior high school. Vigorous objections are made to teachers whose experience has been confined to the high school alone, and yet more vigorous objections to inexperienced college graduates. These two classes seem unable to adapt themselves to the junior high school. Their professional training is often of an inadequate, non-functioning variety, and they attempt to apply the method of instruction used in high schools or colleges to the immature students of the junior division of the school, not realizing, it seems, that subject matter must be worked over and fitted to the capacity of the pupils.

In order that unity in the school system be preserved, care is needed in defining the duties of the junior-high-school principal and his relation to other executive officers in the school system. In

the recent Cleveland survey, Judd shows that each of the junior high schools in that city has "two principals, one a man and the other a woman. In a general way, the functions of these officers are described by saying that the man is to have charge of the boys and the woman of the girls. It appears that neither one has responsibility over the course of study. The man makes the program and has supervision over certain types of work. Other subjects and teachers are assigned to the woman. This organization appears to be clumsy and expensive and to fail at the point where greatest supervisory activity is needed, namely, in arranging the details of the course of study."[7]

Some school boards have adopted a plan of making the junior principals, assistants to a principal of high schools. This, it would seem, should aid in bringing all the parts of the school into closer relation.

Superintendents who would reorganize their schools must first have a clear idea of what they intend to do, and then proceed to instill this idea into the minds of their teaching force and school patrons.[8] But this is only preliminary, for buildings must be provided, courses and curricula worked out, and details of administration completed. Often it has been necessary to postpone reorganization for two or three years because of one or more of these considerations. Finally, it cannot be concluded from the literature they issue that the heads of school systems themselves always have the "junior high school idea;" but rather that many of them are following the example set by other cities, and are establishing junior high schools without giving sufficient consideration to the questions involved (see Appendix, Section 1).

SUPERVISED STUDY

The length of the school day, the length of the class period, and the amount of supervised study, are features wherein great

[7] Judd, C. H. *Measuring the work of the public schools.* The Survey Committee of the Cleveland Foundation, 1916; 255.

[8] See Johnston, C. H. Junior-high-school administration. *Educ. Ad. and Super.* 2: 1916, 71-86.

variation is shown. Table 10 shows the duration of the class period and the presence or absence of supervised study in 149 schools:

TABLE 10

USE OF SUPERVISED STUDY AND DIVISION OF CLASS PERIODS IN 149 SCHOOLS

Period,[1] minutes	20	25	30	35	40	42	45	48	50	55	60	Not given	Total
Number of schools	1	1	26	4	64	2	18	1	9	1	19	3	149
Supervised study	1	..	8	2	23	2	10	1	9	1	19	3	81
No supervised study	..	..	4	1	5	..	1	..	..	..	..	..	11
Not answering	..	1	14	1	36	..	7	..	..	..	..	..	58

Of 8 schools to be established later, 1 will have a 30-, 5 a 45-, 1 a 50-, and 1 a 60-minute period.

There is manifest a decided reaction towards a longer school day for both the junior and the senior school, while the practice of lengthening the periods to approximately one hour and devoting a part of the time to study under the direction of the teacher to whom the pupil has just recited, is growing. Practically all the schools of Table 10 with periods longer than 40 minutes and about one-fourth of those having 40-minute periods have adopted this practice, while the remainder depend upon supervision in the general study hall. It would seem that a 40-minute period presents few advantages; it is too long for sustained attention on the part of immature students of this age and too short to gain many of the advantages of the study-recitation plan.[9]

After reviewing the literature dealing with supervised study, Parker concludes that "experimental investigations show that supervised study improves the work of poor students." He would require less home-study from high-school pupils, and would substitute definitely supervised study for a great proportion of the time now devoted to the study hall.[10] Principal H. L. Miller points out that the hour period results in a gain of ten minutes over the customary 45-minute period, or a net gain of 25 per cent. A school year of 180 days may thus be increased approximately 45 days in actual teaching time in non-laboratory subjects.[11] Prin-

[9] See Wood, W. C. The course of study in intermediate schools. *Proc. Cal. Teach. Assn.*, 1914, 17-33.

[10] Parker, S. C. *Methods of teaching in high schools.* 1915, 522 pp. Chapt. 16, Supervised study (with bib.).

[11] Miller, H. L. Report on the sixty-minute class period in the Wisconsin High School. *Sch. Rev.*, 23: 1915, 244-248.

cipal White, of Kansas City, Kan., sums up the difficulties he has encountered in the study-recitation plan as follows:

> Some teachers do not like the plan; it interferes with their afternoon social engagements. Most parents approve it, but some of the children say it keeps them in school too long. The feeding of twelve hundred boys and girls is a problem. Some teachers cannot control a room for sixty-five minutes, and others cannot stop talking long enough to let the pupils study. It overworks the principal. These may all be overcome in time.[12]

The success of supervised study is dependent upon certain psychological laws, consciously or unconsciously applied. Here may be listed previously acquired knowledge or existing connections, attitudes or habits, the mental 'task' or *Aufgabe*, and the laws governing the formation of connections, or learning. In accordance with the first of these factors, a lesson must contain sufficient familiar elements that the pupil may prepare it in the minimal time, while at the same time it must contain sufficient new elements to effect the most profitable development. Herein probably lies a partial explanation as to why poor students and young students fail to profit through home-study, while it clearly shows how much help in the form of information a teacher should give in supervision. Attitudes and habits of study consist essentially in groups of these factors which are more permanent in character. Teaching habits of study becomes one of the most important tasks of the teacher in charge of supervised study.[13]

It is necessary that a lesson be definitely assigned in order that there may be as little ill-directed effort as possible. This principle also has a psychological foundation. Experimental studies of Marbe, Watt, Ach, Messer, and others, show the imposition of an *Aufgabe* has a material effect upon what is learned, that is, the course of thought is better determined when the instructions are specifically given. Still more obvious in their effects are the more permanent 'attitudes.' "The Herbartian 'step' of preparation,

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[12] White, E. A. An experiment in supervised study. *Educ. Ad. and Super.*, 1: 1915, 257-262.

[13] Texts like G. M. Whipple's "*How to Study Effectively*," Public School Publishing Co., Bloomington, Ill., 1916, can probably be put into the hands of pupils in the senior high school to advantage and many of the rules for study can be imparted by the teachers to pupils in the junior high school.

McMurry's insistence on a definite aim for the pupil, Dewey's doctrine that pupils should feel appropriate needs and take the problem-solving attitude, and Bagley's demand that ideals of general method and procedure should be present as controlling forces in school drills," are notable efforts to have the child permanently disposed to proper response.

More definite and productive of results are the factors in learning which Baird outlines.[14] In the first place, the modality or combination of modalities to which a stimulus appeals are individual and of great importance, although difficult if not impossible to determine by purely objective methods. It seems that the pupil learns more readily if appealed to through his individual modality, and that no particular individual gain results in appealing to all modalities. This presents a problem of no small importance to the teacher, for a single class would very likely contain children predominately visual, or predominately vocal-motor, kinaesthetic, or auditory, as well as some who possess different combinations of types.

Second, various factors must be taken into consideration in the presentation of the stimulus if learning is to be most efficient. Experimentation shows an optimal length of time—neither too long nor too short—for presentation, and that speed in learning and permanence in retention are proportional to intensity of the stimulation. Distributed presentations are more economical than accumulated presentations, for of two associations of equal strength the older association profits most by a single repetition. This indicates that too much time per day or per week may be spent upon a subject (cf. Jessup's conclusion in his study of arithmetic).

It is profitable to make attempts at recall of partially learned material. Learning is more rapid and enduring, the more it connects with associations previously established; and a lesson—as, for instance, a vocabulary in foreign language—is more readily learned when taken as a whole, with additional repetitions for difficult portions. Also, it has been conclusively shown that memory is more lasting when the learner undertakes a task with the expectation of retaining it permanently.

[14] Baird, J. W. Unpublished Lectures, 1915-16. See also Meumann, E. *The psychology of learning.* Translated by J. W. Baird, 1913; 393 pp.

Third, fatigue is a factor to be taken into account in every school task. Laboratory studies show that we may expect to find certain definite, optimal periods for work and rest. This suggests that experimentation should be carried on in the junior and senior high schools to determine the amount of rest that should be given at the end of an hour's work, and to determine the length of the school day and the most profitable division of time among the various school activities.

All of these factors point clearly to the fundamental principle of activity on the part of the pupil himself as the means by which he assimilates instruction and converts it into actual working knowledge, and as the means by which he develops habits of healthful activity and permanent interest and attitudes. Recent studies undertaken to ascertain the amount of activity on the part of pupils have given interesting results. Thus, Wilson[15] cites the investigation of a public school in Manhattan by the Bureau of Municipal Research, which found, by reporting 18 recitations stenographically, that teachers were doing the thinking and talking rather than the pupils. The teachers used 18,833 words, the pupils 5,675, with 420 one-word responses, 208 one-sentence responses, 96 phrase responses, and only 20 extended replies. There were 622 "what," "when," and "where" and but 138 "why" or "how" questions. Similarly, Stevens,[16] by stenographic reports of 20 New York classes, found 64 per cent of the spoken words 'teacher-activity,' and but 36 per cent of the words divided among 20 to 40 pupils. Different classes varied from 116 to 206 questions and answers during a 45-minute period. In 6 history lessons, the percentage of questions involving judgment ranged only from 5 to 27. In a group of 7 classes averaging fewer than 90 questions, 63 per cent were memory questions repeating the text-book; in 9 other classes, 73 per cent.

THE JUNIOR HIGH SCHOOL AND ELIMINATION OF PUPILS

School men have long argued that, given a course of study designed to meet individual needs, given different entrance re-

[15]Cited from Dealey, W. L. Micromotion studies applied to education. *Ped. Sem.* 23: 1916, 241-261. p. 259.

[16]Ibid., p. 259.

quirements, and given a familiarity on the part of pupils with departmental teaching and an acquaintance with certain 'high-school' subjects, a greater number would be held through the ninth grade and possibly through the high school. An attempt has been made in this investigation to collect data bearing upon this question. A number of considerations, however, make any conclusion unsatisfactory. In the first place, most enrolment figures are lacking in many returns. Second, the increase in population, with many other factors contributing to increase enrolment, makes it difficult to arrive at a fair conclusion as to what extent the junior high school has been operative in increasing attendance. Third, each community doubtless presents its own peculiar problems, and it is manifestly unfair to group together for this comparison schools recently reorganized and those that have been operating a longer time.

An attempt was made to secure enrolment for the seventh, eighth, and ninth grades, and the total enrolment of the senior high school under the old plan and under the new.[17] The following tables show comparisons made from data received:

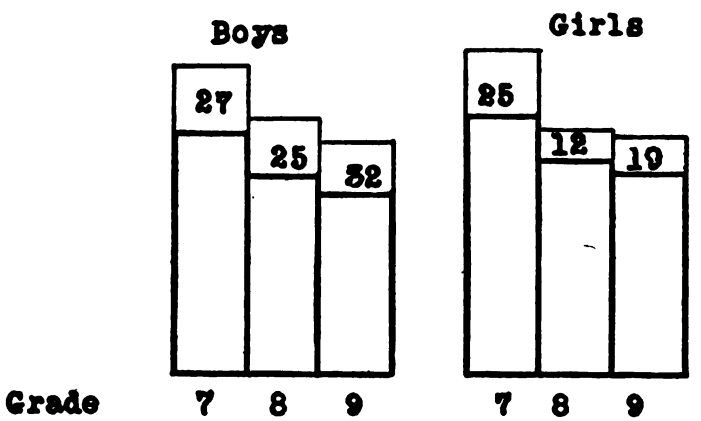

CHART 8

COMPARISON OF ENROLMENT UNDER THE OLD PLAN AND UNDER THE NEW FOR 17 SCHOOL SYSTEMS. ENROLMENT UNDER THE OLD PLAN IS SHOWN BY THE HEAVY LINE. THE PER CENT OF GAIN IS INDICATED NUMERICALLY

[17]For figures see Appendix, Section 4.

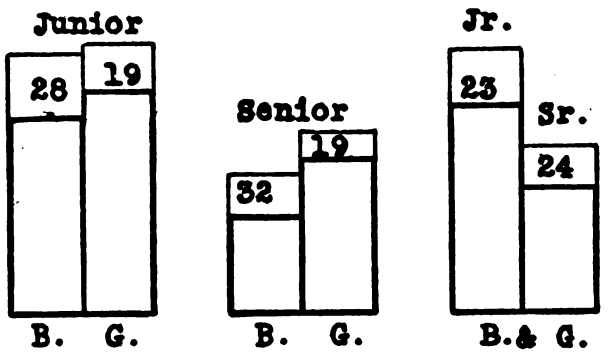

CHART 4

TOTAL GAIN FOR THE JUNIOR AND SENIOR HIGH SCHOOLS FOR THE 17 SCHOOLS INCLUDED IN CHART 3. ENROLMENT UNDER THE OLD PLAN IS SHOWN BY THE HEAVY LINE. THE PER CENT OF GAIN IS INDICATED NUMERICALLY

Under the old plan, 48 per cent of the junior enrolment were boys.

Under the new plan, 50 per cent of the junior enrolment are boys.

Under the old plan, 41.5 per cent of the senior enrolment were boys.

Under the new plan, 44.4 per cent of the senior enrolment are boys.

Under the old plan, for every 100 students in the junior high school, 60 were in the senior high school; under the new plan, 62.

Five additional systems whose returns cannot be applied to this summary give, as far as they go, the same general results.

TABLE 11

GAINS, IN PER CENT, IN FOUR SYSTEMS, ORGANIZED ON THE SIX-TWO-FOUR BASIS:

Seventh-grade	boys, 45;	girls, 27;	total, 35
Eighth-grade	boys, 16;	girls, 0;	total, 7
Total junior high school	boys, 30;	girls, 13;	total, 20
Total senior high school	boys, 17;	girls, 13;	total, 13

Under the old system, for every 100 students in the seventh and eighth grades, 106 were in the high school; under the new system, 115.

The data shown in Chart 5 do not mean that 20 per cent of all the seventh-grade pupils, for instance, drop out of school before entering the eighth. It is probable that a considerable portion are held in the seventh grade and repeat the work.

Ayres shows that the usual loss between the seventh and eighth grades is 28.6 per cent; between the eighth and ninth, 28 per cent.[18]

[18] Ayres, L. P. *Laggards in our schools.* 1909, 236 pp. p. 13.

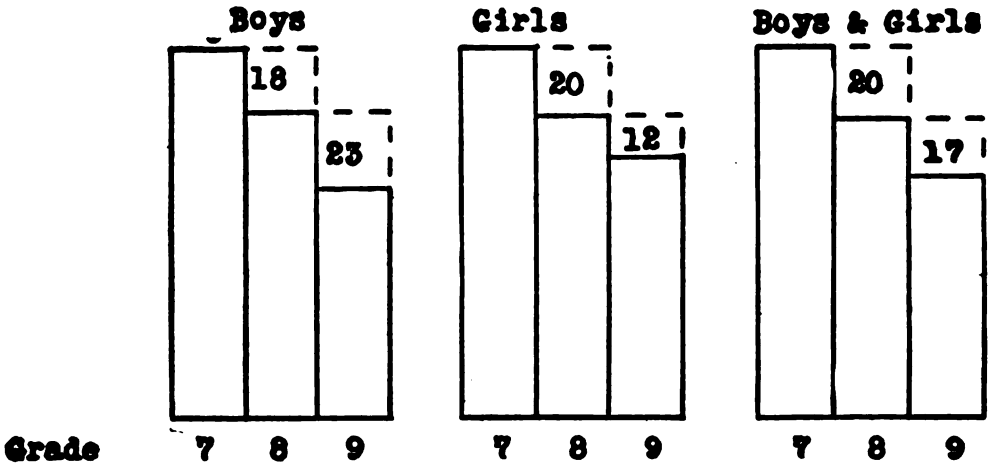

CHART 5

PERCENTAGES OF STUDENTS LOST BETWEEN THE SEVENTH AND EIGHTH GRADES AND BETWEEN THE EIGHTH AND NINTH IN 34 SCHOOLS ORGANIZED UPON THE SIX-THREE-THREE OR SIX-SIX PLAN

In these 34 schools, for every 100 boys in the junior high school, 53 are in the senior high school; for every 100 girls in the junior high school, 66 are in the senior high school. Combining, for every 100 students in the junior high school, 59 are in the senior high school.

Twenty-two additional school systems organized upon the six-two-four basis show a loss between the seventh and the eighth grade of 15 per cent of the boys and none of the girls, as against an expected loss, according to Ayres, of 28.6 per cent.

For every 100 boys in the junior high school, 133 are in the senior high school; for every 100 girls in the junior high school, 166 are in the senior high school. Combining, for every 100 students in the junior high school, 147 are in the senior high school.

Summarizing these results, and including other systems whose data were not furnished in such condition as to be applied to some of the preceding tables, we obtain the results shown in Chart 6.

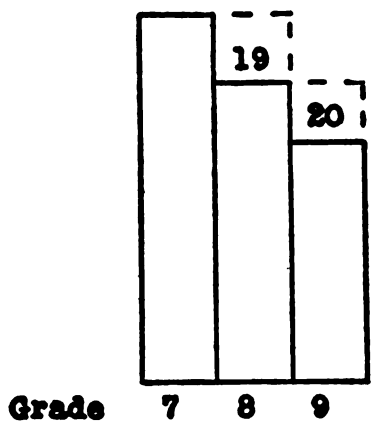

CHART 6

SIXTY-FOUR JUNIOR HIGH SCHOOLS LOSE 19 PER CENT OF THEIR SEVENTH-GRADE PUPILS BETWEEN THE SEVENTH AND EIGHTH GRADES. THE USUAL LOSS IS, ACCORDING TO AYRES, 28.6 PER CENT; ACCORDING TO THORNDIKE[19], 32.5 PER CENT. FORTY-SIX JUNIOR HIGH SCHOOLS LOSE 20 PER CENT OF THEIR EIGHTH-GRADE PUPILS BETWEEN THE EIGHTH AND NINTH GRADES. USUAL LOSS, AYRES, 28 PER CENT; THORNDIKE, 32.5 PER CENT

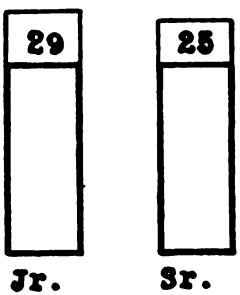

CHART 7

TWENTY-SEVEN SCHOOL SYSTEMS SHOW A GAIN OF 29 PER CENT IN THEIR JUNIOR-HIGH-SCHOOL ENROLMENT; 26 SCHOOL SYSTEMS SHOW A GAIN OF 25 PER CENT IN THEIR SENIOR-HIGH-SCHOOL ENROLMENT

[19]Thorndike, E. L. Elimination of pupils from school. *U. S. Bur. of Educ. Bull.* No. 4, 1907, 63 pp. p. 17.

Twenty-three schools had 47.8 per cent boys in the grades that later formed the junior high schools; under the junior-high-school plan, 49.4 per cent.

Twenty-four schools enrolled 40.6 per cent boys in their high schools under the old, 43.5 per cent under the new system.

Sixty schools enroll 46 per cent boys in their senior high schools. Ayres gives 43 per cent as the average percentage for boys in high schools.

Reports from several schools are here appended to give a clearer idea how the junior high school is affecting the problem of elimination in individual cities:

Crawfordsville, Ind. The per cent of pupils dropping out at the end of the eighth grade is no larger than the per cent dropping out at the end of the seventh grade, the ninth grade, or any other grade.

Lewiston, Idaho. The junior high school has a most beneficial effect here in the Lewiston schools. The school enumeration has scarcely changed, losing a little, if anything, while the upper six grades of the school system, that is, the present junior and senior high schools, have increased during the past two years from 303 to 442. Instead of falling off from 87 to 40, which it previously did, the eighth grade this year has enrolled 91 and the ninth grade 91 and last year there were only four lost between the eighth and ninth grades.

Roanoke, Va. The intermediate school plan has practically done away with the question of elimination peculiar to the fifth and sixth grades. We lose no more pupils at this point now than between any other two grades or, indeed, within any given grade.

Crookston, Minn., reports that in 1914-15 11 per cent of the seventh-grade pupils and 15 per cent of the eighth-grade pupils did not enter the next grade, evenly divided as to sex.

Berkeley, Cal., Grand Rapids, Mich., and Evansville, Ind. Principal W. B. Clark, of the McKinley Intermediate School, Berkeley, furnished data showing that, since the establishment of the school, 94.73 per cent of the pupils completing the eighth grade have entered the ninth, and 95.29 per cent of those completing the ninth grade have entered the tenth. Principal Preston, of the Franklin Intermediate School, Berkeley, reports that of the last seven classes completing the eighth grade under the old organization, 40.53 per cent entered the high school, and that of the first six classes completing the eighth grade of the intermediate school, there entered the ninth of the same school 65.53 per cent, not counting those who were transferred from other buildings. Principal Paul C. Stetson states that 86 per cent of the pupils in the eighth grade in the Grand Rapids junior high school last year entered the senior high school, as compared with 76 per cent of the eighth grades in the grammar schools of the city. In Evansville, Ind., according to Principal Ernest P. Wiles, only 56 per cent of the pupils completing the eighth grade in 1912 entered the high

school, as against 84 per cent last year of the pupils in the junior high school. (Briggs, T. H., *Rept. U. S. Commissioner Educ.*, 1914. vol. 1, p. 143.)

The fact that the school attendance for the state, based on total school enumeration and actual school enrollment and attendance, has increased 4.27 per cent during the two years since this pre-vocational work was revised and introduced into all our schools and the further fact that the average daily attendance on enrollment has increased 8.98 per cent indicates the value and popularity of this prevocational work. I do not know any other factor which might account for such an increase in enrollment and average daily attendance during this period. (Book, W. F., Vocational education and the high school. *Univ. of Ill. Bull.* No. 15, 1915, pp. 226-237, esp. p. 233.)

Houston, Texas. It is interesting to observe that we have had an enrolment of 1,648 white persons in the grades formerly known as high-school grades, as compared with 1,341 of the year preceding. This shows an increase of 307, or about 23 per cent, which is slightly more than double the rate of increase in the schools as a whole. This, of course, does not include the seventh-grade pupils enrolled in the junior-high-school building. However, it is the next year and the years following that must tell the real story of the success of the junior high school as a means for holding pupils in school. (Horn, P. W., *Elem. Sch. Jour.* 26: 1916, pp. 91-95.)

Rochester, N. Y. In conclusion, Rochester submits the following defense for this junior high school:

1. It has thus far increased by 15 per cent the number of pupils who have remained for eight years of work. This argues well for the reduction of eliminations from the seventh and eighth grades.

2. It has increased from 51 per cent to 94½ per cent the number of pupils who have completed the eight years of work and who are still remaining in school.

3. It has, thus far, produced a much saner distribution of high-school pupils. Whereas the distribution of all our high-school pupils is 66 per cent in the general or college-preparatory courses, 27 per cent in commercial courses, and only 7 per cent in the industrial and household-arts courses, the distribution of ninth-year pupils in the junior high school is 33 per cent in the general or college preparatory courses, 33 per cent in the commercial courses, and 34 per cent in the industrial- and house-hold arts courses. * * * * (Weet, H. S., *N. E. A. Bull.*) 4: 1916, No. 6, p. 152.)

Dansville, N. Y. The attendance in this department has increased as is shown by the table.

1912-13			1913-14			1914-15		
Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
37	42	79	39	41	80	44	49	93

The increased enrollment is due to two causes. There is less elimination of students from the seventh and eighth years, and a larger number of rural

students are entering to prepare for high school. (Foster, J. M. *A Study of the Dansville High School.* 1915. p. 15.)

Neodesha, Kan. It is therefore with interest that I give the yearly enrolment in our Neodesha high school for the seventh, eighth and ninth grades for the past four years, going back one year before the establishment of the junior high school. The enrollment for 1915-16 is based on the actual enrollment in October, 1915, and will be larger before the end of the school year.

	Seventh Grade	Eighth Grade	Ninth Grade
1912-13	70	63	61
1913-14	78	63	64
1914-15	92	71	71
1915-16	98	86	76

The figures show an increase of 40 per cent in the seventh grade, 36 per cent in the eighth, and 24 per cent in the ninth grade, over the enrollment in those grades in 1912-13 before the junior high school was organized. (Study, H. P., *The Junior High School,* 1915. p. 5.)

Chanute, Kan. On roll at close of 1913-14, 1,811; at close of 1914-15, 1.896, a gain of 85, or 4.6 per cent.

Percentage of gain in aver. daily attendance for the system was..... 3.48
Gain for the upper four grades.....20.
Gain for the junior and senior high schools.....13.
In the first six grades a loss of..... .3

At the end of the third month this year (1915-16):

The gain of the system by aver. daily attendance is..... 2.5%
The gain in the upper six grades is.....15.2
Loss in the elementary grades..... 2.5

Grand Rapids, Michigan, reports that since its organization in 1911, the junior high school has increased in numbers from 430 to 981 and the teaching force from 14 to 36. The principal reports that the work of the three-year pupils is of a distinctly higher grade than the work of the freshmen in the ordinary high school. (Elliff, J. D., *Missouri Sch. Jour.,* 32: 1915, p. 249.)

Muskogee, Okla. The enrollment of the present senior class is, boys, 35, girls, 41. To these should perhaps be added 12 or 15 who are on the doubtful list, but in all probability they will make up required credits for graduation at the end of the year. The enrollment of the senior class has increased since the establishment of the junior high school, as is indicated in the following graduating classes: 1914, 71; 1913, 49; 1912, 49; 1911, 35.

Ogden, Utah. Junior high school established in 1909. In 1910, there were 43 high school graduates—8 per cent of the total enrolment of the senior

high school. In 1914, there were 84 gradutes—12.2 per cent of the total enrolment of the senior high school.

Evansville, Ind. The graduating class has increased from 90 to 135.

Los Angeles, Cal. The distribution by grades in per cents of total enrolment is:

Grade	7	8	9	10	11	12	7-8-9	10-11-12
1910-11	7.8	6.2	5.9	2.7	1.6	.8	19.9	5.1
1913-14	7.7	7.7	4.9	3.0	2.1	1.5	20.3	6.6

The following quotation from Briggs summarizes the answers to the questionnaire used in his study:

> Of the number of principals of junior high schools reporting, 107 declare that the organization does retain pupils in school better than the older plan, and 2 say that it does not. To the three who say frankly that they do not know what the effect is, should probably be added all those who fail to answer the question.[20]

In the returns received in the course of this investigation, superintendents have been reticent in saying the junior high school has reduced elimination. Of the less than half of them that answered the question, thirty-one say it has done so; two say it has helped; and the rest say either that it has been so recently organized they are not able to tell what the effect will be or that they have no data on the question.

From the foregoing data, the following conclusions are indicated:

1. Increased enrolment in grades seven, eight and nine is due in part, at least, to the junior high school. The same is true of grades ten, eleven, and twelve.

2. The percentage of students held in the junior-high-school grades is somewhat greater than under the old plan. This is also true of the senior high school.

3. The percentage of boys held in the last six grades is greater under the reorganized system.

4. Even yet the percentage of pupils eliminated at the end of the seventh and eighth grades is entirely too large. Here pupil mortality is probably greater than those interested in the junior high school are aware.

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[20]Rept. of U. S. Comm. of Educ., 1914. Vol. 1, p. 142.

THE JUNIOR HIGH SCHOOL AND RETARDATION OF PUPILS

It is more difficult to secure figures on retardation than on elimination, partly because of the recency of reorganization, and partly because, for various reasons, figures have not been compiled. Statistics of the most value would be those of separate schools comparing retardation by grade and class over a period of years.

Sufficient returns are not at hand to combine the returns from the different schools. The following paragraphs give the most important data received:

Decatur, Ill. Though we have a conviction that elimination and retardation have both been lessened by virtue of our new organization, figures have not been kept in such a way as to give us accurate comparative data.

Clinton, Ia. We have no figures bearing upon the question of elimination and retardation, but we have a large number of pupils who are over-age in these upper grades and we find that by offering a prevocational and differentiated course for this class of boys and girls, a much larger number remain to continue their studies through the Junior High and into the Senior. * * * * Because of this carefully supervised study plan, we find fewer of our pupils failing in first-year studies, such as algebra, Latin, and German, which are the new and untried fields of study, and for that reason so often cause many pupils to 'fall down' in the first-year high-school work.

Aurora, Ill. I find last year 29 per cent of the pupils were carrying on work of this kind and that none gained. This impresses me as rather extreme and it may be that we are setting the standards too high, or it may be that there should have been more retardation previous to this time. There is also the added fact that we have a large number of pupils coming into our seventh grade from parochial schools, who find it hard to carry on the work with the other pupils and these tend to increase the number retarded.

Santa Ana, Cal. No definite figures are available that would be of special value. We have a compulsory attendance law in this state and special effort is made to hold pupils in the school until they complete the required fourteenth year of age, as required by law. We have found that by having departmental teaching the brightest pupils are able to complete the required course of two years in one-and-a-half years, and that the slower pupils require an extra semester to complete the course. Each semester from five to ten pupils are permitted to skip by making up in extra credits and about half that number fail of promotion. Opportunity is given those failing to make up their failures the next term if they show the spirit to apply themselves. Most of them are able to be promoted in this way.

Brookings, S. D.	Seventh Grade		Eighth Grade		Ninth Grade	
	Boys	Girls	Boys	Girls	Boys	Girls
Per cent repeating under old plan	25	20	30	25	30	25
Per cent repeating under new plan	10	8	10	5	15	12

Richmond, Ind. Percentage of over-age pupils in Richmond city schools, considering six and seven normal age for the first grade, seven and eight for the second, etc.:

	1913		1914		1915	
Over-age	Boys	Girls	Boys	Girls	Boys	Girls
All Schools.....	21.1	14.5	20.	12.	17.5	9.7
Garfield Junior.....	24.2	14.5	26.	15.	21.	10.
High School.....	21.1	15.4	21.	11.	14.	11.

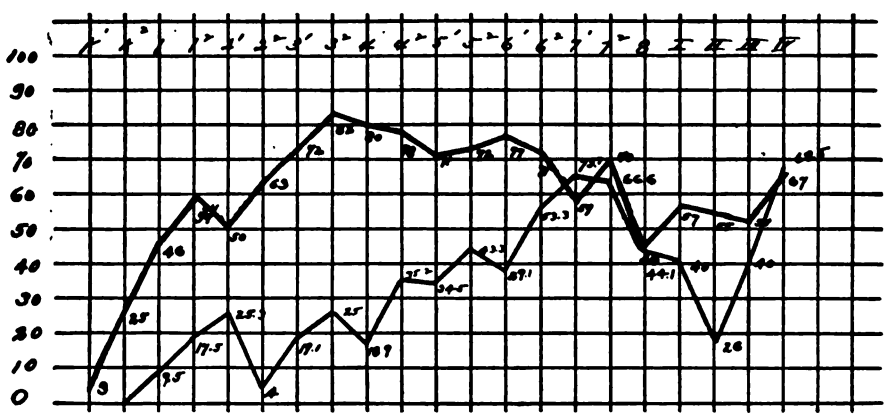
Hackensack, N. J. During the term ending June, 1912, just before the new plan of organization went into effect, the following numbers of pupils were repeating the grade: 7th, boys 14.5 per cent, girls 13.4 per cent; 8th, boys 8.2 per cent, girls 9.7 per cent.

At a corresponding time three years later: 7th, boys and girls 9.3 per cent; 8th, boys and girls, 10.8 per cent.

Faribault, Minn. Reports 16.2 per cent failures in the ninth grade under the old plan; 25.2 per cent under the new.

Curwensville, Pa. Two years ago out of an enrolment of 36 in the eighth grade we had 12 who were retarded. Today with an enrolment of 26 in that year we have 6 retarded, a decrease of about 23 per cent.

Solvay, N. Y. To overcome a large amount of retardation in the fall of 1912, special classes were provided, and the Binet tests and other measurements were utilized to determine the standing of the pupils. Account was also taken of physiological age.



The Curve of Retardation. Upper line shows the percentage of retardation of over-age pupils in September, 1913; lower line shows percentage of over-age pupils in February, 1916. The Bachman scale is used. This considers the child retarded if he is more than 6½ when he enters the first grade, 7½ for the second, 14½ for the ninth, etc.

The ratio of the pupils above the compulsory age limit to those below it, is a peculiarly valuable test by which to determine the success of a school curriculum and spirit. For pupils who remain in school after they are allowed by law to go to work, do so because they are finding something which appeals to them as thoroughly worth while. In September, 1913, this ratio of pupils above the compulsory age limit to those below it was 2 to 13. It is now 2 to 11, a gain of nearly 20 per cent.

A high retardation percentage above the sixth grade is, therefore, an indication that the school is successful rather than the reverse. For, if pupils remain in school voluntarily, it is because they and their parents believe it to be worth while. (Cox, P. W. L. Report, 1915, pp. 27-32.)

Los Angeles, Cal. The percentage of promotions in the intermediate schools in all subjects is 3.4 per cent higher than in the high schools. The promotions in the ninth grade of the intermediate school are 6.4 per cent higher than in the high school. That failure in this grade in the high schools has presented a most serious problem is significant. There are two principal explanations for this result. First, the ninth-year pupil in the intermediate school is a senior in his school, while in the high school he is adjudged a 'scrub.' And second, the unnatural gap that exists between the eighth-grade elementary school and the first year of the high school has been eliminated. The loss in the ninth grade of the high schools by pupils leaving school has been abnormally high, reaching 54 per cent. The intermediate school loses but a small percentage of its pupils.

By reference to a similar table in the elementary-school report it will be seen that the promotions in the seventh and eighth grades of the high schools listed are higher than in the regular elementary schools.

The table shows that promotions in the smaller high schools are much higher than in the large high schools.

I believe that the size of the high school is responsible, in part, at least, for this result. A school with an enrolment exceeding 1200 to 1500 pupils is dangerously liable to lose the personal element in teaching and substitute the mechanical for it. This is a poor substitute and must result in deplorable loss.

Mathematics is the subject in which the highest rate of failures occurs.

Manual work, physical training and music, show the lowest rate of failures.

To one who knows these schools there seems to be a close relationship between failures in subjects and the educational philosophy and temperament

of those teaching them. The dominant factor, is, however, the character of the subject taught. (Superintendent's report, 1914. pp 190-191.)

At Los Angeles the scheme has been projected largely from the office of the Superintendent. As his interest has been chiefly in the field of vocational education the first plans proposed in organizing curricula for these schools emphasized strongly this phase of work. As a result, pupils in many cases advanced to the regular high schools poorly prepared for the work there, and frequent failures resulted. In consequence of this a more conservative plan has been adopted this year through the cooperation of principals of the intermediate schools and high schools. (Hollister, H. A., *School and Home Educ.*, 1915. vol. 34, p. 118.)

In more than half of the replies to the questionnaire the request for data on retardation was unanswered. Thirty-five say the junior high school has reduced retardation; 4 say it has helped; and a number say either that their schools have been so recently organized they are unable to say what the effect will be or that they have no data on the question.

In the above figures and estimates, two points are noticeable. First, there is in several schools a gradual reduction of the percentage of students retarded; and second, there is in a few other schools an increase in the number retarded. The chief point brought out is that the junior high school is not a sure cure for this problem; but, on the contrary, the greatest care is needed to protect the young pupil from a departmentalized school where requirements in "high school" subjects are too high, or where subject matter is otherwise poorly presented and where the individual is lost sight of. If these obstacles are overcome, we have reason to believe retardation will be reduced.

APPENDIX

SECTION 1

JUNIOR-HIGH-SCHOOL TEACHERS

This section contains quotations from letters from superintendents and extracts from various other sources dealing specifically with junior-high-school teachers. It also contains the requirements made by the state of California for intermediate-school teachers; and an outline of special courses given at Pittsburg and Columbia universities and at the State Normal School at Bridgewater, Mass. (see pages 93-96.).

Fresno, Cal. The qualifications of teachers are the same as those for the other elementary schools. The teachers have been selected from the elementary schools on the basis of their special fitness for departmental teaching.

Oakland, Cal. Most of our junior-high-school teachers hold regular high-school certificates. These, in California, are practically equivalent to a Master of Arts degree.

Norwalk, Conn. We have established no hard and fast requirements for teachers in our school. In general, we believe that normal-school training, experience in grammar-school work, adaptability and professional ambition are more important than mere college graduation. We are now at work on a plan for vocational guidance.

Decatur, Ill. Our junior-high-school teachers have very much the same qualifications that our other grade-teachers have. There are a few college graduates amongst them and most of them are normal-school graduates. We aim to employ normal-school graduates, or their equivalent in scholarship and professional training, for all of our grades below the high school.

Quincy, Ill. The qualifications for junior-high-school teachers are the same as for the senior high school.

Aurora, Ill. Of the regular teachers in this school, five are normal-school graduates and one a college graduate.

Crawfordsville, Ind. Practically all our teachers in the ninth to twelfth grades are college graduates. In the seventh and eighth grades we desire them to be college graduates, but do not *demand* it. We want these teachers to be experienced and capable in every way.

Richmond, Ind. No set standard has been adopted as to qualifications of our teachers. We are frequently obliged to choose between an inexperienced

teacher of good scholarship and one with successful experience but less scholarship training. We decide each case on its merits, of course giving preference to the applicant with college training, if other conditions are at all equal. A number of our teachers are college graduates, some have had both college and normal courses, and two have A. M. degrees. On the other hand, several of our most valuable teachers have had but little college training.

Clinton, Ia. We have the same qualifications for teachers in the ninth grade that we have in our senior high: that is, they must be graduates of a standard college with some professional training. Thus far, we have made no standard qualifications for the eighth-grade teachers who have the common branches, except that they be high-school graduates, with some professional training in addition thereto, and successful experience through a considerable period of years in the grades.

Lewiston, Idaho. The senior-high-school teachers nearly all teach one or more junior-high-school classes. This introduces the teachers to the pupils and gives the pupil the advantage of a close acquaintance with older teachers.

Chanute, Kan. The standard qualifications of the junior-high-school teachers with us are determined by the price we can pay. At the present time we have four college graduates and the remainder have completed a high-school course with approximately two years of training in normal schools. Every teacher employed in the junior high school has had previous experience in teaching. Those taken from grade schools are the ones without a degree. The teachers who have degrees were taken from high schools.

Crookston, Minn. One of the difficulties to be guarded against is the placing of inexperienced college people in the junior high school in the capacity of instructors. First of all, they seem to be, as a rule, out of sympathy with this lower grade work, and do not present it effectively. * * * * I plan in the future to employ advanced normal graduates with considerable experience.

Rochester, Minn. We have, with very few exceptions, college graduates in our junior and senior high school. I rather think the type of a teacher with an additional year at the normal school, say three years beyond the high school, would make better teachers for our junior and senior high school, unless the college preparation has been for this work.

Trenton, N. J. For the academic subjects, we are transferring teachers—college graduates with experience in teaching, now in charge of the ninth-grade classes in city high school—and are selecting also teachers from the elementary schools who have taken advanced courses of study in their respective departments and have distinguished themselves by their success in teaching. For the industrial subjects, we are trying to find candidates who have had successful experience in the industry; that is, who are able to earn a living in the industry to be taught, who are able to teach, who are of irreproachable character and who have had good academic training. These positions are exceptionally hard to fill.

Rochester, N. Y. Once it was decided to select experienced grade teachers, the problem of intelligent selection presented itself. Accordingly, one year before the junior high school was to open, a series of Saturday morning institutes was begun. Classes were organized in Latin, German, English, elementary science, and mathematics. These were for applicants for teaching positions in the academic course. Specially trained teachers were available for the commercial and household- and industrial-arts courses, though Saturday morning institutes were organized and carried on through the year in these courses also. The major emphasis in these latter was on courses of study.

To these courses every experienced grade teacher in the system who met the minimal requirements and who cared to apply was admitted. Every applicant for a position as teacher of mathematics in the junior high school was required to have had, for example, the full mathematics courses of the upper high school. To continue with this subject of mathematics as illustrative of the principle which prevailed in these institutes, three definite things were accomplished. In the first place an opportunity was given for drawing up in outline a course of study in general mathematics for the eighth grade or second-year junior-high-school pupils of the academic course. * * * * The institute was in charge of the head of the department of mathematics in the high school to which the pupils of this particular junior high school would go. * * * In the institute class, on the other hand, were the experienced grade teachers with their knowledge of the capacities and limitations of upper-grade study. * * * * In the second place, these institutes gave to the grade teachers an opportunity for subject-matter review in algebra and geometry. And, lastly, the work of the teachers in these institutes constituted one important factor in the ultimate selection of teachers. What has been said of this course in general mathematics was equally true in principle of each of the other courses. (Weet, H. S. *N. E. A. Bull.*, 4: 1916, No. 6, p. 151.)

Eugene, Ore. I feel that the junior high school will result in the development of a very much superior type of upper-grade teachers than those ordinarily found in the seventh and eighth grades, for the successful junior-high-school teacher must have enough breadth of training or experience to be able to see not only her own part of the course, but also where the pupil is coming from and where he is going after leaving the junior high school. My own experience has been that the teacher with the most varied experience and training is the one most valuable for this work. The teacher with a normal-school course, rounded out by later college or university work would have an ideal training, to my mind, for this work.

Houston, Tex. The matter of the qualification of junior-high-school teachers is, indeed, a vital one. We have found by experience that those teachers who are university graduates, but who have for several years been teaching successfully in the elementary schools, are decidedly more successful as junior-high-school teachers than are the university graduates whose teaching experience has been exclusively in high-school work of the older type. There may be

several reasons for this. One of them is that the elementary-school teacher feels that she has somewhat of a promotion when she comes to the junior high school, while the high-school teacher sometimes feels erroneously that she is making a step downward. The chief reason, however, seems to me to be that the average good teacher in the elementary school comes nearer having the right attitude toward her work than does the average teacher in the "high school as it has been." I feel, however, that this discovery as to teachers is at least one definite contribution which we can make to the literature on junior high schools.

Furthermore, we find a number of teachers in our elementary schools who have not had the advantage of a university degree. These have, by our regulations, been excluded from the opportunity to teach high-school pupils. Many of these teachers have, however, gone ahead and taken a great deal of university work along some one particular line, such as English, for instance. Teachers of this kind are frequently among our very best teachers in the elementary work of our intermediate grades. Some of these are making the very best teachers we have for our junior high schools.

Ogden, Utah. We require that one-third of our junior-high-school teachers shall be college graduates with normal training. The other two-thirds must have two years of normal training, or its equivalent, in some particular special line.

Roanoke, Va. In my opinion the teacher who is a graduate of a standard four-year high school and has two years of collegiate training in the subject she offers to teach, may be said to be qualified. In the intermediate school I think about 40 per cent of the teachers ought to be male teachers. I have made some rather interesting observations on this score. While the number of male teachers in Roanoke does not reach 40 per cent for the intermediate grades, still we have some instruction in the sixth grade, and, of course, in the others, from men teachers.

Curwensville, Pa. Normal or college. Normal-school graduates must take professional work during summer at some univerity where courses for junior-high-school teachers are given.

La Crosse, Wis. All teachers must be graduates of the advanced course of some approved normal school. For the higher subjects, we require college graduation as well as professional training. No teacher is engaged who has not had at least one year of successful experience.

We need teachers in the junior-high-school grades as thoroughly trained and as efficient as those in the senior high school. Ultimately, yea, speedily, this means teachers with college degrees and professional training. It ought to mean, also, teachers of successful experience and maturity of judgment. The task of introducing pupils for the first time to new lines of thought and responses calls for the highest possible skill. The young callow girl or boy, perfect it may be in the knowledge of the subject to be taught, but ignorant

of the deeper meanings of life and life's relations, will serve the cause of education vastly better if put in charge of advanced courses than over beginners. From the typical young Ph. D. man in college and the typical young A. B. student in junior high school may the supervising authorities forever deliver the freshman student. (Davis, C. O., *Univ. of Mich. Bull.* Vol. 22, No. 9, 1915.)

The teachers of the high school are of necessity specialists; they have come into the high school after having taken undergraduate and graduate courses and for the most part without technical training in teaching. The methods which they tend to pursue are the only methods with which they are familiar, namely, those which are prevalent among university professors, and which, obviously, are poorly adapted to high school instruction. The point of view of such teachers tends to be that wherein the subject and its content are of paramount importance, oftentimes in a measure overshadowing interest in the pupil himself. Such conditions and such teachers are bad enough for the older pupils, but positively harmful to those coming in from teachers of a wholly different type respecting preparation, sympathy, outlook, and training. By selecting teachers in the lower high school who have first of all had successful experience in teaching in the grades, and who in the second place have taken enough advanced academic work to broaden their horizon somewhat beyond that of the grade teacher, the ideal combination is secured. Furthermore, by insisting that such teachers be assigned at least two different subjects rather than one, as often obtains in the larger high schools, the tendency toward undue specialization in these early years can be checked. (Bunker, F. F. The better articulation of the parts of the public school system. *Educ. Rev.*, 47: 1914, 255-256.)

The object lesson from this school is that teachers should be carefully selected for their adaptability to this most trying stage of common-school education. In this case conditions chiefly economic compelled the use of some teachers not at all suited to their work. Such conditions, if continued, are well calculated to defeat the chief aim of such a reorganization. Not only was the selection of teachers bad, but the situation was still further complicated by the evidently inadequate supervision. (Hollister, H. A., *School and Home Education*, 34: 1915, p. 118.)

California. Regulations governing permits to teach in intermediate schools. Holders of elementary-school certificates who have completed two years of work in a college, or one year of work in a college in addition to a normal-school course, may teach in the third year of any intermediate-school course, provided they comply with the following regulations, which are hereby established by the State Board of Education in accordance with subdivision 3-b of Section 1771 of the Political Code.

I. *For Candidates Who Are Not Graduates of Normal Schools.*

* * * That the candidate has completed at least sixty semester hours in regular college courses in such institution, including at least ten hours of peda-

gogy, and at least thirty hours in any three of the following departments: English, French, German, Spanish, Latin, History, Mathematics, Physical Science, Biological Science.

II. *For Candidates Who Are Graduates of Normal Schools.*

* * * That the candidate has completed at least thirty semester hours of which twenty hours shall be in regular college courses in such institution, in any two of the following departments: French, English, German, Spanish, Latin, History, Mathematics, Physical Science, Biological Science.

Columbia University. The following courses for junior-high-school teachers were announced for the summer session of 1916: Literature, English composition and grammar; methods of teaching Latin; demonstration class in first-year Latin; materials for civics; the teaching of general science; material for history; regional geography; the teaching of mathematics; biology.

There was also a course in the theory and practice of teaching; and a course in organization and administration.

Pittsburgh University. A course was given during 1915-16 dealing with the organization, curriculum, and principles of teaching that should obtain in the junior high school. Additional lectures were given on the historical background of the junior high school; school surveys and the junior high school; organization existing in the junior high school; characteristics of adolescents; features of foreign school systems pertinent in organization of junior high schools; qualifications of teachers for junior high schools; social activities for junior high schools. For the last semester the work was based upon the following books: Judd, *Psychology of High-School Subjects;* Parker, *Methods of Teaching High-School Subjects;* Dewey, *How We Think.*

State Normal School, Bridgewater, Mass.

I. Outline of course for the training of intermediate teachers.
   1. Dissatisfaction with the present arrangement of eight years' elementary and four years' high school.
   2. History of the progress of the intermediate school idea.
   3. The main reasons advanced in support of this reform.
   4. Objections to the plan from these points of view:
      a. Administrative.
      b. Pedagogical.
   5. Changes involved in
      a. Program of studies.
      b. Methods of teaching.
   6. The extent to which this reorganization has been effected throughout the country in general and in Massachusetts in particular.
   7. Practical, even if temporary, standards of professional equipment of the intermediate-school teacher.

II. The new curriculum already provides:

1. More thorough training in the subject matter of those branches to be taught, such as English language and literature, history and social science, mathematics and geography.
2. A longer period of practice teaching in outside towns and cities.
3. Electives in practical science, or practical arts, or advanced geography.

III. With this start it is proposed further to develop this "intermediate" curriculum offered the normal students as follows:

1. A study, more thorough than could be accomplished in the two-year curriculum, of special groups of subjects, one group to be elected from among the whole number of groups.
2. A more extended study of psychology with particular reference to problems of adolescence.
3. A study, elementary as the limitations of earlier training and of available time compel, of economics and sociology.
4. Ample apprentice teaching in the intermediate or junior high school. (Stacy, C. R. The training of teachers for intermediate schools. *Educ. Ad. and Super.*, 2: 1916, 448-455.)

SECTION 2

TYPICAL JUNIOR-HIGH-SCHOOL CURRICULA

The material in this section has been selected to give a wide range of illustration of junior-high-school curricula. The number of the types corresponds to the classification beginning at page

TYPE 8

Santa Fe, New Mex. (One curriculum.)

Grade 7. Required: Eng. 5; math. 5; hist. 3; civil gov. 2; geog. 3; physiol. 2; fine arts 3; music 2; house. arts 2; ind. arts 2; Span. 2.

Grade 8. Required: Eng. 5; math. 5; hist. 3; civics 2; gen. sci. 3; fine arts 3; music 2; house. arts 5; ind. arts 5; Span. 2.

Grade 9. Required: Eng. 5; alg. 5. Elective: Latin 5; Span. 5; first year sci. 5; ind. art. 5; house. art 5; freehand 3; mech. draw. 3; music 2.

The studies of the junior high school are required of all students, their purpose being in general to introduce pupils to a wide range of interests, and to prepare for the senior high school.

Springfield, Ill. (One curriculum).

Grade 7. Required: Eng. (read., lit., gram., spell., pen.); arith.; geog. (½ yr.); U. S. Hist. (½ yr.); physiol. (½ yr.); music; draw.; indus. work. Elective: (Choose 1) German; indus. work.

Grade 8. Same as grade 7.

Grade 9. Required: Eng.; alg.; music; draw. Elective: Latin; German; anc. hist.; gen. sci.; com. arith.; indus. work.

Mt. Vernon, Ind. In the seventh grade, no electives are allowed excepting the industrial work (manual training, agriculture, sewing, cooking, music, and drawing). However, the pupils are told that, if they make a grade of 87 per cent or more on the average in the 7B and 7A, they will be allowed to elect other subjects. The course of study has been so organized that all of the essentials in these subjects are covered when the pupil has completed Grade 7A. As soon as any pupil has made an average, for two succeeding semesters, of 87 per cent or more in either one or in all of the subjects indicated, he is allowed to elect Latin or German, algebra, or industrial history, in the next succeeding half-year, provided it is the wish of his parents that he do so. If he does not make a grade of 87 percent or more, he is required to continue the work in those subjects in which he fails to make the given per cent. The course of

study is organized so that there is additional and practical work for the pupil in grade 8 who fails to make the minimum grade. A pupil is given full high-school credit for such regular high-school subjects as he is permitted to elect to take in the junior high school.

In the eighth grade, all of the regular eighth-grade subjects are offered, both in the 8-B and 8-A grade, for such pupils as failed to make the minimum grade which permits them to elect the high-school subjects. Courses in Latin, German, algebra, and industrial history are also offered for the pupils who do not succeed in making the minimum grade and whose parents permit them to elect said subjects.

In the 9th grade, the regular high-school subjects are offered, with the usual elective privileges.

TYPE 3A

Richmond, Ind. We offer elective one sixth of the total amount of work in each grade. Work in English, mathematics, history-civics, geography, physical training, music and drawing is uniform for all and constitutes five-sixths of a pupil's entire work. For the remaining one-sixth he may elect Latin, German, English composition, or industrial work. Only pupils whose records show ability above the average are permitted to elect the Latin or German; the high-school work, being a composition course, is retained to satisfy patrons who are not reconciled to hand work but whose children are not eligible to the language course. Our industrial course is very popular and, we think, very successful. It should be noted that the pupil electing this has all the hand work required of academic pupils in addition to his elective, which makes his work in this line almost one-third of his total. As yet we think of the industrial work as prevocational only, merely trying through it to enable the pupil to determine whether his ability is chiefly in some line of hand work rather than academic lines. The scope of our industrial work is as yet rather limited, we offer woodwork, printing and drawing for the boys, and cooking, sewing and drawing for the girls. With increased facilities and teaching force we hope to broaden our field and thus increase the opportunity for each pupil to find himself. We have seriously considered introducing commercial work on an equal footing with our other electives but have not as yet seen our way clear to do so. I feel very certain that elementary shorthand, typewriting and bookkeeping would be of practical value to any pupil of the seventh and eighth grades. I do not think time spent on these would be wasted if the pupil later decided in favor of a purely academic course in the high school and college.

San Francisco (One curriculum).

Grade 6. Required: Writing 50; arith. 250; lang. (comp. and gram.) 200; spell. 75; lit. and oral expression 200; geog. and hist. (alternating) 300; music 60; draw. 60; man. tr. or dom. sci. 80; gen. sci. (including physiol.) 80.

Grades 7 and 8. Required: Arith. 160; lang. (Comp. and gram.) 160; spell. 80; draw. 120; mod. lang. or typing 160; man. tr. or dom. sci. 160; gen. sci. 120.

The success of the departmental schools was so great that it seemed wise, two and one-half years ago, to give three of them a modified course of study and designate them as 'Intermediate Schools.' The work being so thoroughly systematized under the departmental system, it was found possible to add to the ordinary course of study a larger amount of elementary science, manual training, and domestic arts, and to give the pupils a choice between typing and a modern language. After two years of experimenting we were able during the summer vacation to formulate a time-schedule for these schools. The schools are a marked success, and we wish to extend this new type of school, so that pupils in every part of the city may be within easy reach of an intermediate school.

Rochester, Minn. (One curriculum.)

Grade 7. Required: Eng. 5; arith. 5; Amer. hist. 5. Elective: German 5; chorus 5; calisthenics 4; dom. art 5; shop 5; arts and crafts 5; dom. sci. 5; military drill 3.

Grade 8. Required: Eng. 5; geog. 5; pen. and spell. 5. Elective: Same as grade 7, with bkpg. 5; mechan. draw. 5 and agric. 5 in addition.

Grade 9. Required: Eng. 5; community civics 5; gen. sci. 5; math. (el. alg.) 5. Elective: Same as grade 8, with business law 5; indus. hist. 5; Latin 5; and poultry and gardening 5 in addition.

Boston, Mass. At the beginning of the school year 1913, authority was granted by the school committee for the establishment of classes in modern languages in the seventh and eighth grades of four elementary-school districts. The following year the number of these districts was increased by six, and at the beginning of the present school year ten additional districts undertook the work. The establishment of these foreign-language classes has been voluntary on the part of the principals, and the selection of a particular foreign language has been determined largely by the presence in the district of someone qualified to teach it. In all the districts the work is optional on the part of the pupils.

Coincident with the introduction of this work a council of eight members was appointed, comprising several heads of departments of modern foreign languages in the high schools. * * * * This council held several meetings, and invited to their conferences the teachers of modern languages in the grades.

The members of this council inspected thoroughly the modern language work in the grades, and in a report last June approved the quantity and quality of instruction given. The council thereupon recommended that pupils who had completed two years' work in modern languages in the elementary schools should receive on their entrance to any high school in the city five points' credit

toward their high-school diploma. This recommendation was approved by the school committee. The council thus recognized the work done in the seventh and eighth grades as the equivalent of the first-year work done in the high school.

A council on English for these intermediate grades likewise was created. This council was made up of high-school heads of departments. This council was created for the purpose of unifying the work in English in the seventh and eighth grades of the elementary schools and the first year of the high school, in order that the work might be made sequential, uninterrupted and free from repetition. * * * *

This (mathematics) committee has made such a definition, and progress of work for the first-year mathematics that will include instructions in algebra with the equation as a core, in constructive geometry and in arithmetic. * * * The purpose of these conferences is to make a sequential course in mathematics for grades seven and eight of the elementary schools and the first year of the high school.

A council likewise has been formed comprising teachers of science in the seventh, eighth, and ninth (high-school) grades. This council will aim at the construction of a program for work in science for the seventh, eighth, and ninth (high-school) grades.

From the foregoing, the goal of our work is apparent. It is to differentiate gradually at the end of the sixth grade, and to relate progressively and intimately the work of the seventh, eighth, and ninth grades. It is hoped that eventually these three grades will be segregated and constitute what is familiarly known as the junior high school.

TYPES 3A AND 5

Grand Rapids, Mich. (One curriculum.)

Grade 7. Required: Eng. 5; arith. 5; geog. 4 (½ yr.); Amer. hist. 4 (½ yr.); read. 1; bench work 3; dom. sci. 3; dom. art 1; printing 1; music 1; art. Elective: Bus. arith. 5; applied Eng. 5; Latin 5; mech. draw. 2; German 5; chorus or orchestra 2; printing 5 to 25 (½ yr.); dom. art 2 to 10 (½ yr.).

Grade 8. Required: Same as Grade 7, except shop work for bench work. Elective: Latin 5; German 5; mech. draw. 3; bus. arith. 5; applied Eng. 5; chorus or orchestra 2; printing 5 to 25; dom. art 5 to 10; art 5 to 10; metal working 2; el. sci. 2.

Grade 9. Eng. 5; alg. 5; anc. hist. 5; Latin 5; German 5; pen. and spell. (½ yr.) 5; phys. geog. 5; bkpg. 5; dr. and shop. 5; freehand 2½ (½ yr.); dom. art 5; phys. tr. 1; design 2½ (½ yr.).

For those pupils who do not seem to find what they need in the regular courses we offer special work. Our short commercial course is an example of what can be done for those who need special work.

This course was first opened in September, 1913, with about 25 students enrolled. There are now enrolled in that department about 70 pupils. The work is designed, primarily, so that each one receives individual instruction as far as possible. The traditional method of promoting is completely ignored. We plan to advance the individual student as rapidly as possible. Efficiency in the preceding work is the determining factor in all cases.

An examination of the course * * * * will show there are no electives offered. If a student is to complete this course and at the same time receive thorough preparation, the work necessarily must be made very intensive. Students are urged to remember that this course differs from the four-year commercial course in one important respect. The short commercial course will produce bookkeepers and stenographers but the four-year commercial course is designed to produce business men. In other words, the latter course is broader in its scope than the former.

TYPE 3B

Duluth, Minn. One curriculum for Grades 7 and 8, but differentiated into four curricula with Grade 9, three of which prepare for the advanced high school. Course (d) does not prepare for the high school.

Grade 7. Required: Read. and spell.; gram. and comp. (oral and written); arith. (pract. and com.); man. tr.; sewing; freehand; mech. draw.; music.

Grade 8. Required: Same, except cooking in place of sewing, civics for history in last semester. Algebra is added in last semester, and German or Latin runs throughout the year, 3 lessons per week.

Grade 9. Required: Eng. hist.; household econ. Elective: (*a*) Lat. or Ger., alg., freehand or music; (*b*) book., sten., com. arith., freehand or music; (*c*) alg., man. tr., mech. draw., printing; (*d*) Lat. or Ger., gen. sci., freehand, music, printing.

Fresno, Cal. Thus far, the elective work has been offered in but the eighth grade; later, it probably will be extended to the seventh grade. One of the three intermediate schools, the Edison Industrial School, is prevocational in its type. The school day is six hours long; the girls in the eighth grade are given one hour per day in domestic science including sewing and cooking, and the boys are given one hour per day in exercises in building trades, home improvement, and school construction and repair work. The pupils of the seventh grade are also given a large amount of industrial work. Considerable prominence is given to agriculture in this school, as the people of the community are largely engaged in the fruit industry of the surrounding country. * * * * The elective subjects have been chosen with a view to the useful nature of the material. One year of elective work in the intermediate schools has been planned so as to count as the first half of the similar work in the high school. Instead of the usual plan of introducing a foreign language, we are offering a year of work in advanced English, which will be the equivalent of the first half-year's work in the high school.

Trenton, N. J. One curriculum for Grades 7 and 8, but (*a*) academic, (*b*) commercial, and (*c*) industrial curricula beginning with Grade 9.

Grade 7. Required: Eng. 4; Eng. (with typing or for. lang.) 4; geog. and hist. 4; sci. 4; math. 4; shop 4; draw. 3; gymnasium 2(½-hr. periods); music 2 (½-hr. periods).

Grade 8. Required: Eng. 4 (with typing); or for. lang. 4; geog. and hist. 4; sci. 4; math. (with elem. business forms) 4; gymnasium 2; music 1.

Grade 9. Required: Eng. 4; sci. 4; hist and civics 4; math. 4; draw. 2; gymnasium 3; music 1. (*a*) For. lang. 4; shop 4; (*b*) bkpg. 4; type. 4; (*c*) shop 6; draw. 2.

Each day consists of six periods of sixty minutes each. Work in science and mathematics will demand separate classes for girls and boys. Mathematics will not necessarily be the same for all boys and girls in the same year.

We are probably laying less stress upon the vocational and prevocational aspects of our curricula and our shop work than is customary in other schools of this type. Our aim in our industrial activities is more broadly educational than it is distinctively vocational or prevocational. We hope to use our industrial activities in such a way that they will vitalize our courses in mathematics, drawing, English and science and yet have considerable value as preparation for efficiency in the pupils' after-school careers, whether in industrial, commercial or professional pursuits. It is our aim, through our methods of teaching, selection of subject matter and personality of the teachers, to secure more important results in the line of self-expression, self-realization, self-reliance, skill, general intelligence, habit and character than in preparation for any specific vocation or for admission to higher educational institutions. The organization of the school and of its various curricula is to be regarded as an experiment and while every detail will have been thought out very carefully in advance, the organization is sufficiently plastic to permit any change that experience and unforeseen conditions may prove to be desirable.

La Crosse, Wis. The curriculum is the same for the first two years. There is a choice when it comes to the third year, which corresponds to the ninth grade or first-year high school. At this time, the pupil begins bookkeeping, or Latin, or German, or picks his course with reference to his subsequent education. * * * * We give now in the junior high school, during the first year, half the work in the manual arts which formerly occupied one year in the high school. After having finished this work, the pupils may go to the regular high school, and there specialize in some trade, as dressmaking or millinery for the girls or cabinet making, wood turning, foundry, forge work, or machine-shop practice for the boys.

South Norwalk, Conn. We try to provide for all pupils who have done the sixth-grade work and in addition for all those who are too old for their grade in the fifth or sixth. This latter group will in time probably include all the older pupils who are behind grade, except those who are markedly defective.

The backward groups in the junior high schools are taken care of with somewhat different assignments than those in the regular group. It is expected next year that those pupils will receive a very large amount of concrete and prevocational work and that the amount of abstract work will for them be reduced to a minimum.

Roanoke, Va. For the intermediate school I believe that, along with a good academic course, industrial work should be given, this to be of a strictly prevocational nature. I do not favor multiplication of too many branches in the intermediate school. Indeed, I am constrained to believe that the public school must learn the lesson of thoroughness and intensity rather than of extensive courses at the risk of very little real mental development.

TYPE 3C

Crookston, Minn. Academic, industrial, and commercial curricula.

Grade 7. Required: Gram. and read. or bus. Eng.; arith.; hist.; pol., ind. or com. geog.; shop or dom. sci.; pen. and spell.

Grade 8. Gram. and classics or bus. Eng.; arith. or com. arith.; hist.; shop or dom. sci.; pen.; spell.

In the academic course two double periods per week are devoted to shop work and domestic science. In the other two courses, three are given to those subjects.

East Chicago, Ind. Three curricula: (a) college preparatory, (b) industrial, and (c) commercial.

Grade 7 (the same for all). Required: Gram. 5; U. S. hist. 5; arith. 5; draw. 4; spell. 3; writ. 2½; music 2; physical train. 2½.

Grade 8. (*a*) Physiol. (½ yr.) 5; gram. (½ yr.) 5; alg. 5; Latin or German 5; dom. sci. or man. tr. 5; music or draw. 2; phys. tr. 2½. (*b*) Civics 5; physiol. (½ yr.) 5; civics (½ yr.) 5; dom. sci. or man. tr. 5; indus. geog. 5; phys. tr. 2½. Electives selected from the other courses. (*c*) Bus. arith. 5; bkpg. 5; shorthand 5; typing 5; com. Eng. 5; pen. 2½.

Grade 9. (*a*) Eng. 5; Latin or German 5; gen. sci. 5; geom. 5; music or draw. 2; phys. tr. 2. (*b*) Eng. 5; phys. tr. 2. Electives from other courses including shop work, dom. sci. printing, and mech. drawing. (*c*) Bkpg. 4; shorthand 5; typing 5; com. geog. (½ yr.) 5; com. law (½yr.) 5; Eng. 5.

Cincinnati. Lafayette Bloom Junior High School. (*a*) Industrial arts, (*b*) household arts, and (*c*) commercial curricula.

Grades not given. Required. Phys. tr. and hygiene 5; Eng. 2; hist. and civics 2; music 1. Elective: (*a*) Choose 20 additional hours: shop work 10; application 1; science 3; math. 4; draw. 2; German 5. (*b*) Same as (*a*), except household arts for shop, and design 2 in addition. (*c*) Hist. of commerce and industry 4 required. Choose 16 additional hours: sci. 3; application 1; math. 5; printing 3; drawing 2; German 5; advertising and salesmanship 2.

Richmond, Va. The general course, though making slight modifications in allowing more option in the choice of subjects, covers practically the work of the last two years of the present elementary course and that of the first year of the present high-school courses. The commercial course, while including the more important subjects offered by a general course, also offers elementary instruction in the usual commercial subjects. The prevocational courses, while likewise embracing the essentials of a general course, give instruction in the general principles underlying various industrial and domestic arts. The differentiation in these courses is seen in the elective rather than in the required subjects. Satisfactory completion of any one of the three courses offered will enable the pupil to begin the second year's work of the senior high school.

The choice of a course is very important, and any course selected must meet the approval of the principal and the advisory committee. A course once begun should be pursued to its completion, unless a change is permitted by the principal and the advisory committee.

Norwalk, Conn. Provisional outline for junior high school. (*a*) Academic, (*b*) commercial, and (*c*) manual arts curricula for grades seven and eight. With the ninth year, the commercial curriculum is divided into (1) a clerical and (2) a commercial curriculum; and the manual arts into (1) a general and (2) a shorter curriculum.

Grade 7. Required: Eng. 260; math. 200; geog. 160; hist. and civics 160; draw. and man. tr. or dom. sci. 160; music 40; phys. exercises 50; opening exercises 30; assembly 40. (*a*) Elem. phys. and hygiene 100; pen. 60; study 240. (*b*) Elem. phys. and hygiene 80; pen. and com. forms 80; study 240. (*c*) Same as (*a*), except that 40 minutes is taken from study and added to man. tr. or dom. sci.

Grade 8. Required: English 260; hist. and civics 200; music 40; phys. exercises 50; opening exercises 30; assembly 40. (*a*) Math. (arith. and alg.) 200; sci. (agric.) 120; draw. and man. tr. or dom. sci. 120; pen. 60; geog. or Latin 160; study 220. (*b*) Com. arith. and bkpg. 200; sci. (agric.) 80; pen. and typing 140; German or com. geog. 160; study 220; (*c*) Com. arith. 200; sci. (agric.) 120; draw. and man. train. or dom. sci. 160; pen. 60; com. geog. or German 160; study 180.

When pupils of the seventh year are grouped into courses, the differentiation will be largely one of selecting material for study in accordance with the phase of work designated by the name of the course and adjusting methods of procedure to meet these requirements. The subjects to be scheduled in the various courses are practically the same. Pupils can, therefore, be easily reclassified at the close of the year. The outline for the eighth year shows a larger variation. * * * * At the close of this year it will be more difficult for pupils to pass from one course to another. * * * * In the ninth year the work scheduled is more definitely grouped into courses. For pupils who will probably

leave school at the close of this year, or possibly after one year in the Senior School, the clerical and shorter courses are planned. In the first year of the senior high, the academic courses will divide into the classical and the scientific, the commercial retains its two divisions and the manual arts course divides into two courses as now planned or into three, if facilities are available for a domestic science course.

TYPE 3D

University of Oregon. The main argument behind this movement, to my mind, is the fact that the four years does not afford sufficient time for consecutive work in the main cores of instruction. As a result, the work in such subjects as history, civics, science and foreign languages is scattered and superficial. In our model school our main aim will be to work out coherent lines of consecutive instruction comparable to those in the best continental secondary schools. Of course, we shall not attempt to do this simply through the employment of coercion, as in Germany, but by the applications of the psychology of adolescence.

Lewistown, Idaho. Beginning with the third junior year, all the work is elective, except English. All work, however, must be elected by majors and minors. Five years' work is offered in Spanish, German, and Latin and six years in shop work, which includes forging and construction work. Six years' work is offered in home economics. The senior-high-school industrial work for both boys and girls is made strongly vocational. Agriculture was introduced this year and two years' work is offered.

Wisconsin High School (Madison) (One curriculum).

Sixth Class. Required: English 5; math. 5; geog. and gen. sci. 5; music; phys. ed'n. Electives: German 5; French 5; man. arts 5; dom. sci. 5; dom. art. 5; draw. 3.

Fifth Class. Required: Eng. 5; math. 5; hist. and citizenship 5; music; phys. ed'n. Elective: Gen. sci. 5; German 5; Latin 5; French 5; man. arts 5; dom. sci. 5; dom. art. 5; draw. 5.

Fourth Class. Required: Eng. 5; music; phys. ed'n. Elective: math. 5; gen. geog. 5; agriculture 5; anc. hist. 5; German 5; Latin 5; French 5; man. arts 5; dom. art 5; draw. 3.

As a further guide in the selection of studies, it should be clear at the outset that each pupil, *beginning with the fourth class,* will be required to complete for graduation, in addition to the required English, at least *three units* of elective work in at least two of the remaining groups: (*a.*) history; (*b.*) mathematics; (*c.*) science; (*d.*) foreign language.

In deciding upon courses of study, pupils and parents are requested to keep in mind the general plan of the school. The six-year organization may, for guidance in arranging studies, be divided roughly into three two-year periods. At the beginning of each two-year period each pupil is permitted to make a new selection of studies, in so far as changes desired are in agreement

with the general requirements stated above. The aim is to map out *at opportune times* two-year courses in accordance with the best knowledge then available as to the pupil's capability and purpose. By this method the courses selected are intended to provide a *continued trial* of a pupil's qualities, with a view of finding his best.

TYPE 4

Solvay, N. Y. The work, as we give it, is divided into six separate courses. While often the same subjects may be required in every course, there may be considerable difference between the subject as given in one course and the same subject as given in another course. English, very similar to the elementary syllabus requirement, except that we teach less technical grammar, is given in the academic course in both the seventh and eighth grades, with still less technical grammar. English is required in the household and practical arts courses, and in the two vocational courses; but we give in these courses no technical grammar whatever. History in the academic course and commercial course follows the elementary-syllabus requirements. History in the vocational courses, household and practical-arts courses is much less complex, and gives more emphasis to inventions and commercial history. A wide-range divergence is found in arithmetic. The academic course takes commercial applications of percentage, but soon gets to treating it as algebra. They treat their mensuration as geometry. Pupils in the commercial course spend all their time on commercial applications and arithmetic, in the particular insistence on a high standard of accuracy and rapidity in computation. Drawing, too, differs between the courses, as does also the science work. The academic pupils all take German five times a week for two years. Commercial pupils take typewriting for two years, bookkeeping for one year. Household-arts pupils take two double periods of cooking and two double periods of sewing each week for two years. Practical-arts pupils take four double-periods a week of shop work and one double-period of shop drawing for two years. The vocational pupils spend one-half of their time in practical work. The boys of the commercial and academic courses get one double-period a week of shop work, the girls of these courses get one double-period of cooking and one of sewing.

TYPE 5

Clinton, Ia. (1) [Offers] a high-school preparatory course for those who expect to continue their studies in high school after completing the ninth grade; (2) a vocational course for pupils who do not expect to continue in school longer than the ninth grade. For these pupils a full course in manual training is offered for boys and a full course in home economics for girls, two years in length. In the place of algebra, they are given industrial arithmetic and bookkeeping.

We have had experience of a year and a-half with segregation of classes with regard to sex and find many advantages with regard to the plan. In the first place, the boys recite better in classes by themselves, which is also true

of the girls. We are able to arrange a program of vocational classes—such as manual training and home economics—more conveniently where boys and girls are in separate assembly rooms and in separate classes in all their studies. We are also able to give to girls a modified course in arithmetic in the eighth grade, which is a very important thing, for much of the work in arithmetic is entirely outside of the girls' requirements in life. We also find it desirable and practicable to emphasize certain topics in physiology for girls of special importance to them, and on the other hand, we elaborate questions for the boys which are of special concern to them. We are this year trying to modify and adapt the general-science work to the needs of the boys and girls, but we find this somewhat difficult because there is no good text especially prepared for girls. I consider this question of the segregation of the sexes a very important one for the junior high school or for any intermediate school which has to deal with boys and girls ranging in age from eleven to sixteen. But the full value of this separate instruction will not be accomplished until the demand is recognized in textbooks which contain matter especially prepared for the need of girls. The average textbook comes nearer meeting the requirements of boys than of girls.

TYPE 7

New Britain, Conn. (Prevocational grammar school).

Curricula: (*a*) General, designed to prepare for any course in the high school or the vocational school; (*b*) business and English, designed to prepare for the commercial curriculum in the vocational school and also intended for those pupils who go directly from grade seven and eight into positions in stores and offices; (*c*) practical arts (boys), designed primarily to help boys find themselves and make an intelligent choice of trade courses in the vocational school, also to be of service to boys who are to leave school for industrial life at the end of the seventh or eighth grade; (*d*) practical arts (girls), designed to prepare for the duties of home making and house keeping, also leading to the home-making curricula or to trade curricula in the vocational school.

Grade 7. Required: Eng. (gram., comp., spell.) 4 or 5; arith. 3 or 4; geog. 3 or 4; hist. and civics 3 or 4; read. and lit. 3 or 4; draw. and art 1 or 2; sci. and health 1; music 1; pen. 1; physical exercise 1; gen. ex. 1. (*a*) Man. arts 2, or dom, sci. 2; (*b*) correspondence 2; typewriting 2; (*c*) ind. work 9; (*d*) household arts 3, draw. and ind. work 3; sewing and dressmaking 3.

Grade 8. Required: Eng. (gram. comp. spell.) 4 or 9; lit. and read. 3, 4_4 or 5; hist. and civics 3 or 4; science and health 1; music 1; pen. 1; physical exercise 1; gen. ex. 1. (*a*) Arith. 5; man. arts or dom. art. 2; draw. and art 1 or 2; (*b*) com. arith. 3; com. geog. 1; book. and accounting 3; correspondence 2; typewriting 2; (*c*) ind. arith. 4; ind. work 4; (*d*) household arts 3; garment-making 3; draw. and ind. work 3; applied arith. 3.

In the required subjects, the greater number of hours per week is found in connection with the general curriculum.

SECTION 3

DETAILED DATA FROM 100 AMERICAN CITIES

Table 12 contains the replies of 100 representative cities to the following questions:

1. When did you put the junior high school in operation? (For summary see Table 1, page 24.)

2. What grades are included in the junior high school? (For summary see Table 8, page 88.)

3. Upon what do you make entrance to the junior high school depend? (See page 48.)

4. (Request was made for figures on enrolment and retardation.) Do you attribute gains or losses in enrolment and retardation to the new system? (See page 101.)

5. Are your manual and household-arts courses planned (*a*) to help the student find his life's work, (*b*) to fit for a trade, or (*c*) for general educative value? (See page 73.)

6. Are these courses required? (See page 75.)

7. Is the junior high school housed alone, or in the same building with the six elementary grades, or with the senior high school? (See page 92.)

8. Does it have its own principal? (See page 96.)

9. Do you offer, or contemplate offering, two years of college work in addition to your high-school course? (See page 94.)

10. Have you any segregated classes or classes grouped according to physiological age? (See page 44.)

11. What is the length of the recitation period in the junior high school? (For summary see Table 10, page 98.)

12. Do you have supervised study? (For summary see Table 10, page 98.)

13. Is there added interest on the part of (*a*) parents, (*b*) teachers, (*c*) pupils (due to this organization)? (See page 94.)

14. In your opinion, do the colleges and universities favor the junior high school? (See page 93.)

Explanation of Table 12. In the column showing entrance requirements, the single asterisk (*) denotes that promotion depends upon the child's ability as judged by the teacher or principal; the double asterisk (**) that entrance depends more upon general ability in the rudimentary subjects, with perhaps some account taken of age; and the three asterisks (***) that mature pupils are admitted from the elementary school. (See page 134.)

In the junior-college column, schools marked (†) are contemplating the establishment of a junior college. (See page 134.)

In the last column, the interrogation point (?) signifies that the one replying did not know whether the collegiate institutions favored the junior high school or not. (See page 134.)

These answers to questionnaire are quoted from C. C. Bingaman: A report on the intermediate or junior high schools of the United States (Goldfield, Iowa, 1916).

Would you advise the junior high school plan for schools having from five to ten teachers? Yes, 90; no, 6; 6 gave answers to the effect that it could not be well worked out with less than from 7 to 15 teachers.

Are students held in school longer because of the added advantages of the junior high school? Yes, 91; no, 4; too early to say, 7.

Do you have departmental teaching? Yes, 143; no, 3.

How many extra teachers were required when you organized this plan? None, 58; one, 21; five, 2; three, 3.

Have you omitted any common branches? No, 98; yes, 8; shortened, 7; better taught, 2.

Did you economize on building room in organizing? Yes, 47; no, 40.

Is home study necessary in the junior high school, if supervised study is given? Yes, 66; no, 7; a little, 11.

Do you have supervised study? Yes, 96; no, 14; in junior high school only, 5; some, 9; favor it, 3.

What students are helped by supervised study? All, 34; medium and slow, 20; weak, 13; any needing help, 1.

Do you have arguments to offer against the junior high school? Yes, 32; no, 78.

TABLE 12

DETAILS CONCERNING THE JUNIOR HIGH SCHOOL IN 100 CITIES

	When	Grades	Entrance Requirements	Less Retardation and Elimination	Purpose of M. T. and D. S.	M. T. and D. S. required?	Jr. H. S. Housed Alone	Own Principal	Junior College	Segregated Classes	Length of Rec. Period	Supervised Study	Added Interest	Do Colleges Favor?
Anaheim, Cal.	.....	6–8	.....	.....	a c	....	el.	no	2 yr	.....	50	yes	all	.....
Berkeley	14	7–9	pro.	yes	c	yes	el.	no	no	no	40	yes	all	yes
Chico	15	8–9	.....	.....	c	no	yes	yes	no	no	45	yes	a b	.....
Fresno	.....	7–8	pro.	.....	c	yes	yes	.....	2 yr	sex	30	yes	all	.....
Los Angeles	11	7–9	pro.	.....	a	.....	yes	yes	2 yr	.....	40	.....	b c	yes
Oakland	11	7–8	pro.	.....	a c	.....	el.	.....	no	no	.....	.....	.....	.....
Palo Alto	13	7–9	pro.	.....	a	yes	yes	yes	no	no	40	yes	all	.....
San Francisco	13	7–8	.....	.....	.....	.....	el.	no	.....	.....	.....	.....	.....	.....
Santa Ana	.....	7–8	pro.*	.....	c	.....	.....	.....	no	sex	40	yes	all	.....
Santa Rosa	13	6–6	pro.	.....	.....	.....	h. s.	no	no	sex	45	yes	a c	yes
Ft. Morgan, Col.	.....	7–8	pro.	.....	c	.....	el.	yes	†	no	45	yes	b c	yes
Lewiston, Idaho	.....	7–9	pro.	yes	a c	.....	h. s.	.....	.....	.....	60	yes	.....	.....
Nez Perce	15	7–9	pro.	.....	a	no	el.	yes	no	no	60	yes	all	†
Aurora (E), Ill.	12	8	pro.	.....	a	no	yes	yes	1 yr	no	30	yes	a b	yes
Decatur	.....	7–8	.....	yes	.....	.....	yes	yes	....	no	.....	.....	.....	.....
Quincy	14	7–9	.....	.....	c	.....	el.	no	yes	no	30	.....	all	yes
Crawfordsville, Ind.	07	7–8	**	.....	c	yes	h. s.	yes	†	no	40	yes	all	yes
East Chicago	14	7–9	pro.	.....	a c	1 yr	yes	yes	1 yr	no	60	yes	all	yes
Evansville	12	8–9	pro.	yes	a	.....	h. s.	no	†	***	40	yes	all	yes
Gas City	15	7–9	pro.	.....	c	yes	h. s.	yes	†	sex	40	yes	all	†
Lafayette	15	7–9	***	.....	c	yes	el.	no	no	***	40	yes	all	†
Madison	08	6–8	pro.	.....	a b	yes	yes	yes	no	no	30	yes	all	†
Mt. Vernon	15	7–9	pro.	.....	a c	1 yr	yes	yes	no	no	35	yes	all	yes
Muncie	02	6–8	pro.	.....	all	yes	el.	yes	no	no	30	no	all	†
Richmond	00	7–8	pro.	.....	.....	.....	yes	yes	.....	sex	50	yes	.....	.....
Seymour	13	7–8	pro.	yes	c	yes	h. s.	no	no	sex	60	yes	all	†
West Lafayette	15	7–9	pro.	.....	c	.....	h. s.	no	no	no	48	yes	all	yes
Clinton, Ia.	14	8–9	***	.....	all	no	yes	.....	.....	sex	40	yes	.....	.....
Denison	15	7–8	pro.	.....	a c	no	h. s.	no	no	no	45	yes	all	yes
Goldfield	15	7–9	pro.	yes	a	no	el.	no	†	no	60	yes	all	yes
Hampton	.....	6–6	**	.....	c	yes	h. s.	no	no	no	40	yes	b c	.....
Radcliffe	16	7–8	**	.....	b c	yes	h. s.	no	†	no	30	yes	all	yes
Shenandoah	15	7–9	pro.	.....	c	yes	yes	yes	no	no	30	yes	all	†

TABLE 12—Continued

	When	Grades	Entrance Requirements	Less Retardation and Elimination	Purpose of M. T. and D. S.	M. T. and D. S. required?	Jr. H. S. Housed Alone	Own Principal	Junior College	Segregated Classes	Length of Rec. Period	Supervised Study	Added Interest	Do Colleges Favor?
Winfield	14	7–9	pro.	yes	a c	no	el.	yes	no	no	40	yes	all	yes
Arkan. Cy., Kan.	12	7–8	pro.	.....	c	yes	yes	yes	no	no	20	yes	all	.....
Chanute	14	7–9	pro.*	.....	all	.....	yes	yes	no	sex	60	yes	all	.....
Fort Scott	04	7–8	*	.....	all	no	el.	no	no	no	60	yes	all	†
Girard	15	7–8	pro.	.....	all	no	h. s.	yes	no	no	30	no	.....	.....
Great Bend	13	7–8	pro.	yes	a c	yes	yes	yes	no	**	30	yes	all	†
Hays	14	7–9	pro.	.....	a c	no	h. s.	no	no	no	.....	yes	all	.....
Manhattan	14	7–8	pro.	.....	a c	no	h. s.	no	no	sex	40	no	all	yes
Neodesha	13	7–9	pro.	.....	c	no	h. s.	no	†	no	60	yes	all	yes
Newton	13	8	pro.	.....	all	no	h. s.	no	no	no	45	no	all	yes
Topeka	14	7–9	*	.....	a	.....	el.	.....	no	....	30	yes	.....	.....
Winfield	13	7–8	pro.	.....	c	yes	.....	no	†	no	25	yes	all	.....
Corydon, Ky.	14	7–9	.....	yes	.....	.....	.....	.....	.....	yes	40	.....	all	yes
Madisonville	12	7–9	pro.	yes	c	yes	h. s.	no	no	yes	45	yes	all	yes
Morganfield	15	7–9	pro.	yes	.....	.....	h. s.	no	no	no	40	.....	b c	†
Paducah	15	7–8	pro.	.....	c	yes	el.	yes	†	sex	40	no	all	†
Arlington, Mass.	15	7–8	***	.....	a c	no	yes	yes	no	sex	40	yes	all	yes
Boston	13	7–8	.....	.....	all	no	el.	.....	.....	.....	.....	.....	.....	.....
Dudley	15	7–10	pro.	.....	c	no	yes	yes	†	no	40	yes	all	.....
Worcester	99	7–8	*	.....	c	no	el.	no	no	no	30	no	all	.....
Adrian, Mich.	15	7–9	pro.	yes	c	1 yr	el.	yes	no	no	45	yes	all	.....
Detroit	11	7–9	pro.	.....	all	yes	yes	yes	†	no	50	yes	all	yes
Austin, Minn.	14	7–9	pro.	yes	all	no	h. s.	yes	†	no	40	.....	all	.....
Cokato	13	7–9	pro.	.....	a b	yes	el.	yes	no	no	40	yes	all	yes
Crookston	13	7–8	pro.	.....	all	yes	h. s.	yes	no	no	40	yes	.....	.....
Deer River	14	6–6	.....	.....	a	no	el.	no	no	no	40	yes	.....	.....
Duluth	13	7–9	.....	.....	.....	.....	el.	no	.....	.....	.....	.....	.....	.....
Faribault	13	7–9	*	.....	a b	no	h. s.	yes	no	sex	60	yes	all	.....
Hutchinson	13	7–8	pro.	.....	.....	.....	el.	yes	.....	.....	30	.....	all	.....
Rochester	12	7–9	*	.....	.....	.....	h. s.	no	.....	sex	.....	yes	.....	.....
Gothenburg, Neb.	14	7–9	pro.	.....	c	no	el.	yes	no	no	40	yes	all	.....
Concord, N. H.	10	7–8	pro.	.....	c	yes	yes	yes	†	no	40	yes	b c	.....
Hackensack, N. J.	12	7–8	***	yes	a c	no	el.	yes	no	sex	60	yes	b c	†
Trenton	14	7–10	***	.....	a c	no	yes	yes	no	sex	60	yes	all	.....
Brockport, N. Y.	12	7–8	pro.	yes	c	yes	el.	no	.....	.....	60	yes	.....	yes
Danville	13	7–8	pro.	yes	.....	.....	h. s.	no	no	no	45	yes	all	†

TABLE 12—Continued

	When	Grades	Entrance Requirements	Less Retardation and Elimination	Purpose of M. T. and D. S.	M. T. and D. S. required†	Jr. H. S. Housed Alone	Own Principal	Junior College	Segregated Classes	Length of Rec. Period	Supervised Study	Added Interest	Do Colleges Favor†
Scotia	14	7–8	pro.	.....	.....	.....	h. s.	no	no	no	45	yes	b c	.....
Silver Creek	10	7–8	pro.	.....	.....	.....	h. s.	no	no	no	40	no	b c	.....
Solvay	14	7–9	***	yes	a	no	el.	yes	no	sex	.....	yes	all	†
Bismark, N. D.	14	7–8	pro.	.....	a c	yes	el.	yes	†	no	45	yes	b c	†
Devil's Lake	12	7–8	pro.	yes	all	no	el.	yes	†	no	40	yes	all	†
Grafton	13	7–8	pro.	.....	c	no	el.	no	no	no	30	no	.....	.....
Webster	14	7–9	pro.	.....	c	no	h. s.	yes	†	no	40	yes	all	.....
Cincinnati, O.	15	7–10	**	.....	a	yes	el.	yes	no	no	60	yes	b c	.....
Dayton	10	9	pro.	.....	.....	.....	yes	yes	no	.....	42	.....	all	.....
Muskogee, Ok.	11	7–9	pro.	yes	all	.....	h. s.	asst.	1 yr	sex	42	yes	all	.....
Curwensville, Penn.	13	7–9	pro.	yes	c	yes	h. s.	yes	†	no	45	yes	all	.....
Lansdowne	08	7–8	pro.	.....	c	yes	h. s.	yes	no	no	40	yes	all	†
Mohnton	.....	7–9	pro.	.....	.....	.....	.....	.....	no	no	40	.....	all	.....
New Kensington	14	7–9	pro.	.....	all	yes	el.	yes	no	no	50	yes	all	†
Brookings, S. D.	13	7–9	pro.	yes	a c	2 yr	h. s.	yes	no	yes	40	yes	all	.....
Columbia, Tenn.	14	7–8	.....	yes	all	no	.....	no	no	no	40	no	b c	†
Houston, Tex.	14	7–9	pro.	.....	a c	no	yes	yes	no	no	40	.....	all	.....
Murray, Utah	14	7–10	***	.....	a	no	yes	yes	no	no	40	yes	all	.....
Ogden	09	7–9	***	.....	a	no	yes	yes	no	no	35	no	all	yes
Burlington, Vt.	14	7–8	pro.	yes	c	no	yes	yes	no	no	40	yes	all	†
North Troy	15	7–10	pro.	.....	c	yes	el.	yes	†	no	30	yes	all	yes
Bristol, Va.	15	6–8	pro.	.....	a	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond	15	6–8	.....	.....	.....	no	yes	.....	.....	no	35	yes	.....	.....
Roanoke	.....	6–8	***	yes	a	no	.....	.....	.....	.....	.....	.....	.....	.....
LaCrosse, Wis.	14	7–8	*	.....	.....	yes	el.	.....	†	no	35	yes	all	†
Manitowac	13	8–9	*	.....	a	1 yr	el.	yes	no	no	40	yes	all	yes
Rhinelander	13	7–8	pro.	yes	.....	yes	el.	yes	no	no	30	.....	all	†
Wis. H.S. (Madison)	11	7–9	**	.....	c	no	h. s.	no	no	no	50	yes	.....	.....
Diamondville, Wyo.	13	7–9	pro.	yes	c	yes	el.	no	no	no	40	.....	all	yes
Kemmerer, Wyo.	15	7–8	pro.	.....	c	no	h. s.	no	†	no	40	yes	b c	.....
Lamarie (Wyo. Univ.)	13	7–9	pro.	yes	c	yes	el.	no	no	no	40	.....	all	yes

SECTION 4

STATISTICS OF ENROLMENT IN JUNIOR HIGH SCHOOLS

TABLE 18

JUNIOR AND SENIOR ENROLMENT, BY GRADE, UNDER THE OLD AND UNDER THE NEW PLAN

	When Established	PRESENT JUNIOR						OLD JUNIOR						PRESENT SENIOR		OLD SENIOR	
		7th Boys	7th Girls	8th Boys	8th Girls	9th Boys	9th Girls	7th Boys	7th Girls	8th Boys	8th Girls	9th Boys	9th Girls	Boys	Girls	Boys	Girls
Ft. Morgan, Colo.	....	36	43	32	38	....	....	....	....	....	....	....	....	73	139	....	....
Clinton, Ia.	14	....	....	76	78	68	74	....	....	....	....	....	....	136	158	....	....
Radcliffe	16	16	19	16	8	7	7	28	26	16	12	14	8	7	7	20	28
Shenandoah	15	57	64	46	44	49	57	35	52	29	37	32	48	64	72	54	59
Winfield, Ia.	14	12	9	9	10	12	8	9	11	8	13	6	7	18	30	15	21
E. Chgo., Ind.	14	118	108	74	55	66	44	90	74	....	53	45	50	47	74	39	48
Lafayette, Ind.	15	bdg	133	bdg	147	bdg	144	44	46	30	30	....	306	bdg	234	bdg	260
Mt. Vernon, Ind.	15	55	45	34	47	54	51	44	38	27	30	....	48	107	134	100	142*
Seymour, Ind.	18	48	42	38	32	49	49	36	38	27	30	60	48	126	139	110	120
Ark. City, Kan.	12	78	78	51	70	....	....	65	69	68	73	....	....	140	214	86	156
Chanute, Kan.	14	80	75	57	80	47	44	50	71	56	75	....	....	126	68	....	....
Girard, Kan.	15	28	29	28	32	....	....	24	24	22	40	....	....	62	127	55	108
Great Bend, Kan.	18	52	55	40	48	....	....	25	37	27	36	....	....	116	169	87	130
Hays, Kan.	14	18	4	27	12	18	9	7	8	6	8	7	5	20	32	20	38
Neodesha, Kan.	18	44	45	32	39	30	38	28	35	24	32	24	32	46	57	29	48
Adrian, Mich.	15	70	74	53	66	74	72	68	79	68	56	66	62	151	153	144	146
Austin, Minn.	14	53	51	54	49	67	60	52	51	52	50	50	61	88	118	80	97
Cokato, Minn.	18	15	17	16	18	18	28	12	14	15	15	12	16	64	59	41	45
Rochester, Minn.	12	bdg	125	bdg	116	bdg	100	bdg	89	bdg	95	bdg	74	....	....	....	....
Hackensack, N. J.	12	91	118	87	88	....	....	89	101	68	50	....	....	....	....	....	....
Dansville, N. Y.	18	27	33	25	28	27	22	20	21	17	20	15	20	48	99	30	71
Webster, N. D.	14	4	7	6	2	8	4	6	3	4	5	2	9	5	16	6	17
Curwensville, Pa.	18	15	17	16	18	18	28	10	15	16	14	20	19	56	59	40	38
Brookings, S. D.	18	38	27	36	32	35	38	17	19	22	20	21	25	112	127	78	82
Columbia, Tenn.	14	39	35	51	48	....	....	15	25	30	37	....	....	17	14	12	18
Ogden, Utah	09	298	289	190	197	137	158	188	196	148	184	89	108	299	388	228	307
Burlington, Vt.	14	104	109	86	96	....	....	....	....	....	232	....	....	....	....	....	....
Rhinelander, Wis.	13	37	51	40	41	28	38	40	42	28	26	28	36	15	40	54	99
Diamondville, Wyo.	18	8	6	9	15	6	10	6	6	7	15	2	6	15	20	10	8

*Includes the ninth grade.

TABLE 14

PRESENT JUNIOR AND SENIOR ENROLMENT, BY GRADE, FOR SCHOOLS ORGANIZED ON A SIX-THREE-THREE OR A SIX-SIX BASIS

	When Established	PRESENT JUNIOR						PRESENT SENIOR	
		7th Boys	7th Girls	8th Boys	8th Girls	9th Boys	9th Girls	Boys	Girls
Berkeley, Cal.	10	315	355	244	290	217	237	562	509
Palo, Alto, Cal.	13	40	38	39	29	28	26	92	123
Santa Rosa, Cal.	13	76	94	72	58	72	87	141	80
Nez Perce, Idaho	15	14	10	10	9	14	15	31	34
Springfield, Ill.	14	101	101	72	84	71	71	.....	.....
Gas City, Ind.	15	14	15	19	19	8	11	22	13
Hampton, Ia.	.....	27	30	26	20	30	43	.....	.....
Madisonville, Ky.	.....	25	29	19	21	18	20	53	40
Morganfield, Kan.	15	11	27	15	12	13	13	39	42
Kalamazoo, Mich.	.....	218	251	199	190	81	90	317	306
Deer River, Minn.	14	11	12	9	11	7	9	.....	.....
Faribault, Minn.	13	66	56	55	68	64	85	176*	128
Gothenburg, Neb.	14	14	12	11	17	16	14	44	36
Muskogee, Ok.	11	.....	.....	122	127	110	120	.....	.....
Lansdowne, Pa.	08	28	35	24	32	35	36	13	15
Mohnton, Pa.	.....	16	19	4	6	4	5	10	13
New Kensington, Pa	14	60	53	41	45	31	28	49	40
West DePere, Wis.	14	b&g	20	b&g	21	b&g	22	.....	.....
Wis. H. S.	11	19	17	19	7	36	26	44	68
Lamarie, Wyo.	13	9	7	7	6	12	8	22	20

*Old Senior enrolment, boys 45, girls, 76.

TABLE 15

PRESENT JUNIOR AND SENIOR ENROLMENT, BY GRADE, FOR SCHOOLS ORGANIZED ON A SIX-TWO-FOUR BASIS

	When Established	PRESENT JUNIOR				PRESENT SENIOR	
		7th Boys	7th Girls	8th Boys	8th Girls	Boys	Girls
Fresno, Cal.	.....	190	175	222	239	455	448
Crawfordsville, Ind.	07	44	72	49	68	157	205
Madison, Ind.	08	34	41	31	35	74	103
Richmond, Ind.	.....	154	133	113	108	325	343
Seymour, Ind.	13	59	50	29	35	122	140*
Ft. Scott, Kan.	04	100	65	40	60	190	240
Manhattan, Kan.	14	70	60	54	58	167	176
Winfield, Kan.	13	49	74	55	62	250	279
Paducah, Ky.	15	79	76	74	104	169	192
Arlington, Mass.	15	128	115	87	80	284	388
Duluth, Minn.	13	204	187	206	200	808	907
Crookston, Minn.	13	69	59	39	43	108	167
Hutchinson, Minn.	13	39	30	32	28	35	20
Scotia, N. Y.	14	37	27	19	21	67	77
Silver Creek, N. Y.	10	15	30	22	31	40	65
Bismark, N. D.	14	39	43	31	37	90	135
Grafton, N. D.	13	22	19	22	25	85	100

*Senior enrolment, 1912, boys 90, girls 115.

TABLE 16

PRESENT JUNIOR AND SENIOR ENROLMENT, BY GRADE, FOR SCHOOLS ORGANIZED WITH THE EIGHTH AND NINTH GRADES COMPOSING THE JUNIOR HIGH SCHOOL

	PRESENT JUNIOR				PRESENT SENIOR	
	8th Boys	8th Girls	9th Boys	9th Girls	Boys	Girls
Evansville, Ind.	299	212	118	115	302	356
Muskegon, Mich.	b&g	311	b&g	216	b&g	399
San Antonio, Tex.	241	253	182	207	.....	.....
Manitowac, Wis.	28	37	29	41	.....	.....

TABLE 17

MISCELLANEOUS DATA ON ENROLMENT

Aurora, Ill.: Eighth: boys, 91, girls, 81; total senior, 468.
West Lafayette, Ind.: Total, junior, 170; total senior, 180.
Dayton, O.: Ninth: boys, 462; girls, 490; senior boys, 676, girls, 768.
Newton, Kan.: Eighth: boys, 59, girls, 68; senior boys, 142, girls, 199.

SECTION 5

EXTENT OF THE JUNIOR HIGH SCHOOL MOVEMENT IN THE SEVERAL STATES

This section shows the present extent of the junior-high-school movement so far as revealed by this investigation. The quotations are from statements by the various state superintendents or their representatives, and were received during the year 1915-16, unless otherwise stated. Cities taken from lists appearing in various places are recorded merely as "reported" to have junior high schools when no direct communication was received from them. This has been done because cities are often erroneously credited with possessing this form of school organization.

Alabama. "Nothing of any consequence has been done in this state in the junior-high-school movement."

Reported: Florence.

Arizona. The state department reports that agitation is just starting in favor of the junior high school.

In operation: Globe. May adopt later: Douglas, Morenci.

Arkansas. In operation: Hot Springs, Texarkana. Studying plan: Little Rock. Reported: Conway.

California. In operation: Alameda, Anaheim, Berkeley, Chico (discontinued for present), Fresno, Los Angeles, Oakland, Palo Alto, Santa Rosa, San Francisco. Reported: Pasadena, Pomona, San Diego, Santa Monica, Tulare.

Colorado. In operation: Fort Morgan, Silverton, Sterling. Will adopt later: Cripple Creek, Trinidad. Reported: Almosa, Colorado Springs, Greeley.

The Denver survey in a preliminary report recommended the junior high school. Delta will be organized in 1916-17.

Connecticut. In operation: New Britain, Norwalk, South Norwalk (partially).

It will be organized in a modified form in Danbury; in Stamford the town meeting refused to make appropriation. The Bridgeport survey (1913) recommended: "Reorganize the elementary grades so that grades I-VI constitute a unit and grades VII-VIII a unit." Grades 6-8 are now under a process of organization.

Delaware. "We have not reached the stage in our development where this differentiation is necessary or even possible."

Florida. " * * * * we have quite a number of junior high schools in Florida, but the term as used in this State does not correspond strictly with

the same term as used in other states. Our junior high school department is limited to the ninth and tenth grades. We have not yet adopted the "6 & 6" plan, strictly. The question of a different organization or division of grades has been frequently discussed in this state, but our present plan seems to be satisfactory to most of our leading educators."

In operation: Tampa. Reported: Jacksonville.

Georgia. "There are few of our school systems which have junior high schools. Nearly all of the public-school work in this state is based upon the plan of seven years of elementary work and four years of secondary training. A few schools, however, use the 8-3 and 8-4 plan and a few others, as stated before, the 6-6."

Will adopt later: Atlanta, Savannah. Reported: Macon.

Idaho. In operation: Blackfoot, Coeur d'Alene, Lewiston, Nez Perce, Pocatello (temporarily discontinued), Wallace. Reported: Burley.

The junior high school was recommended by the Boise survey and is now partially organized in that city. The department of education at the state university is very favorable to the plan.

Illinois. In operation: Aurora (East), Aurora (West), Blue Island, Cairo, Macomb, Springfield. Partially organized: Belvidere, Decatur, Quincy. Reported: Dundee.

Indiana. In operation: Anderson, Crawfordsville, East Chicago, Elkhart, Evansville, Lafayette, Madison, Mt. Vernon, Muncie, Richmond, Seymour, West Lafayette. Considering plan: Goshen, Greencastle, South Bend. Reported: Battleground, Buck Creek, Clark's Hill, Dayton, Gladdin, Jefferson, Monitor, Montemorency, Romney, Stockwell, Union City, Washington, Wea, West Point.

The department of education at the state university is furnishing literature to schools reorganizing on this plan.

Iowa. "This movement is on in Iowa but is of recent origin. This office is just now collecting accurate information from the entire state, and we shall soon be prepared to give a complete list of schools offering some form of this organization."

In operation: Cedar Rapids, Clinton, Denison, Goldfield, Hampton, Marion, Radcliffe, Shenandoah, Winfield. Sioux City is planning a junior high school; Davenport and Des Moines may adopt it later. Reported: Estherville, Holstein, Maquoketa, Sac City, Spirit City, West Bend.

Kansas. In operation: Arkansas City, Chanute, Ft. Scott, Girard, Great Bend, Hays, Hutchinson, Kansas City, Leavenworth, Manhattan, Neodesha, Newton, Salina, Topeka, Wichita, Winfield. Partially organized: Garden City. Studying plan: Eureka, Lawrence. Reported: Coffeyville, Emporia, Fredonia, Horton, Meade, Mulberry, Williamsburg.

The subject was discussed in the 1915 state-teachers' association, and in the 1916 principals' and superintendents' conference.

Kentucky. "Up to 1908, Kentucky had no high schools except in cities. The legislature in 1908 made it mandatory for each county in the State after

two years, to establish one or more county high schools in which all the pupils of the county, who are qualified to enter, should receive free tuition. There have now (1915) been established more than 200 of these schools and they are doing marvelous work. * * * * Some counties have as many as 5 or 6 of these high schools, so located as to be within easy reach of practically all the pupils in the county. The schools are of three grades, first class, doing 4 years' high-school work, second class, doing three years' high-school work, and third class, doing two years' high-school work."

In operation: Corydon, Covington, Madisonville, Morganfield, Paducah, Paris. Lexington will establish one in September, 1916.

Louisiana. "The junior high school has been discussed in Louisiana but conditions are such that there does not seem to be any demand for the establishment of such schools."

In the superintendent's report, New Orleans, 1914-15, the advisability of the plan for that city was favorably discussed.

Maine. "Several communities have reorganization plans in mind and are likely to undertake definite work in the near future. The city of Old Town has established a junior high school this year. * * * * The city of Auburn has been preparing courses with view of establishing such a school in September."

In operation: Auburn, Biddeford.

Maryland. In operation: Cumberland, Hagerstown. In Baltimore it will probably be recommended to the board of school commissioners in a modified form.

Massachusetts. In operation: Arlington, Boston, Bridgeport, Chelsea, Dudley. Partially organized: Beverly, Brockton, Clinton, Newtonville, Somerville, Springfield, Webster, West Springfield. Will adopt later: Gloucester, Holyoke. Studying plan: Lynn, Malden. Reported: Franklin, North Easton, Reading.

The superintendent in Worcester recently recommended that the junior high school be extended throughout all the elementary schools. The survey in Boston recommended that the junior high school be more completely organized than at present. New Bedford and Woburn are giving some consideration to such an organization. Waltham has had centralized grammar schools for a number of years.

The Massachusetts High School Masters' Club is making a study which will be published during the year 1916-17.

Michigan. In operation: Adrian, Grand Rapids, Kalamazoo, Lowell, Muskegon, Saginaw (East). Will reorganize soon: Bay City, Jackson, Saginaw (West). Reported: Battle Creek.

It has been recommended by the Michigan State Teachers' Association. Ypsilanti Normal College will operate a junior high school soon, and will offer special work for junior-high-school teachers. The University of Michigan

has officially encouraged the six-three-three plan, and allows graduates of the six-year high school to apply for university credit upon examination.

Minnesota. In operation: Austin, Cokato, Crookston, Deer River, Duluth, Faribault, Rochester. Partially organized: Ely. Reported: Bemed, Cloquet, East Grand Forks, Furgus Falls, Grand Rapids, Henderson, Hibbing, Howard, Montivedeo, New Ulm, Renville, Rushford, Sandstone, Villard.

As a result of the recommendations of the survey, the superintendent's office in Minneapolis is carefully considering the advisability of establishing the six-three-three plan. The department of education at the state university is preparing a bulletin on the junior high school.

Mississippi. Reports no progress.

Missouri. In operation: Hannibal, Springfield (Missouri State Normal). Reported: Excelsior Springs, Malden, Unionville.

Montana. In operation: Butte. Reported: Anaconda, Barnesville, Dillon, Recommended by the Butte survey.

Nebraska. In operation: Blair, Gothenburg, Lincoln, North Platte. Will adopt later: Norfolk. Reported: Aurora, Bankroft.

Nevada. "We have no provision here for the six-six plan as yet, and so have no Junior High School. However, the matter of organization of some of our larger high schools on that plan has been discussed somewhat, and it may be brought about in the near future."

New Hampshire. In operation: Berlin, Concord, Keene.

New Jersey. "The State Board of Education of New Jersey is urging legislation which will make possible a state-wide development of the intermediate school plan." (1914-15)

In operation: Bloomfield, Hackensack, Long Branch, Montclair, Nutley, Somerville, Trenton. Studying or experimenting with plan: Atlantic City, Bayonne, Camden, Englewood. Recommended by the East Orange, Montclair, and Nutley surveys.

New Mexico. "The Junior High School has not as yet made much progress in this state."

In operation: Santa Fe.

New York. "We are just collecting for the first time information from all our secondary schools regarding the extent to which there is variation from the conventional course beginning with the sixth grade. We shall tabulate this information a little later."

In operation: Brockport, Dansville, Rochester, Solvay, Scotia, Silver Creek. Will establish soon: Poughkeepsie, Utica. Under consideration: Hudson Falls, Malone. Reported: Dunkirk, Ellensville, Long Branch, Sommerville, Tonawanda, Troy, Wellsville.

The High-School Teachers' Association of New York City has a committee at work upon the junior high school.

North Carolina. In operation: Durham, Will adopt later: Asherville.

North Dakota. In operation: Bismark, Cando, Devil's Lake, Langdon, Webster. Partially organized: Grafton, Minot, Westhope. Reported: Beach, Cooperstown, Hillsboro, Hunter, Kensal, Lakota, Larimore, La Mourne, Page, Petersburg, Williston.

The subject was favorably considered by the fourteenth annual state high-school conference.

Ohio. In operation: Cincinnati, Cleveland, Columbus, Dayton, Madisonville. Will adopt later: East Liverpool, Hamilton, Lima, Youngstown.

The subject has several times been discussed in the State Teachers' Association meetings. It is approved by the state department.

Oklahoma. In operation: Chickasha, Hugo, Muskogee, Oklahoma City. Will adopt later: Bartlesville.

Oregon. In operation: Albany, McMinnville, Salem. Reported: Lake View, Medford, Salwin, The Dalles.

The University of Oregon will establish both a junior and a senior high school in 1916-17. Recommended by the Portland survey.

Pennsylvania. In operation: Curwensville, Ephrata, Hollidaysburg, Johnstown, Naticoke, New Kensington. Studying or experimenting with plan: Altoona, Harrisburg, Lansdowne, Philadelphia, Tyrone, Williamsport. Reported: Ambridge, Ben Avon, Erie, Marburg.

Pittsburgh University has been offering special work for junior-high-school teachers.

Rhode Island. "Do not know of any school in this state where the plan has been put in operation."

South Carolina. Little progress, if any, has been made.

South Dakota. "The following schools in this state are trying the junior high school in some form: Madison, Aberdeen, Sioux Falls, Yankton, Mitchell, Lead, and Brookings. These have not all succeeded in organizing a complete junior high school but have at least extended their departmental work to the seventh and eighth grades."

Reported: Amour.

Tennessee. In operation: Columbia, Jackson, Union City. Will adopt soon: Chattanooga. Reported: Clarksville, Gallatin.

The state department has a study of the problem under way.

Texas. In operation: Austin, Houston, San Antonio.

Utah. In operation: Murray, Ogden, Payson, Price, Salt Lake City. Reported. Park City.

Vermont. In operation: Bennington, Burlington, North Troy, Plainfield. Considering plan: Rutland. Reported: Cambridge, Lowell.

The Vermont survey recommended: "That six-year high schools be established wherever practicable, these schools to continue the work of the six-year elementary schools." The state department is now working out a course of study.

Virginia. In operation: Bristol, Richmond, Roanoke. Will adopt later: Danville.

Washington. In operation: Sumner. Partially organized: Everitt. Will adopt later: Bellingham, Walla Walla.

West Virginia. "A good many of our high schools in West Virginia are interested in the junior-high-school movement and most of our principals are making a study of the junior high school. Within a year or two quite a number of junior high schools will have been established. So far, however, junior high schools have been established only in three or four towns. Charleston has a junior high school with an enrollment of about five hundred students. It is conducted in a building of its own. This is the first year of its existence, however, and the course of study has not yet been organized on a strictly junior-high-school plan. Clarksburg and Spencer are also organizing junior-high-school departments."

Will adopt later: Bluefield, Huntington.

Wisconsin. In operation: Edgerton, Horicon, La Crosse, Manitowac, Rhinelander, River Falls, West DePere, Wisconsin High School (Univ. of Wis.)

The state department in 1914 issued a bulletin recommending the adoption of the plan and giving suggestions. The circulation department of the University of Wisconsin has been furnishing literature to the schools of the state.

Wyoming. In operation: Cheyenne, Diamondville, Kemmerer, Laramie (Univ. of Wyo.), Rawlins, Rock Springs.

Since the above section was compiled, reports have been received from additional cities, as follows:

In operation: Old Town, Me. (1915, grades 7-9); Battle Creek, Mich. (1916, grades 7-9); Malden, Mo. (1913, grades 7-9); Excelsior Springs, Mo. (1915, grades 7-9); Unionville, Mo. (1915, grades 7-8); Aurora, Neb. (1911, grades 6-8); Pittsburgh, Pa. (1914, grades 7-9).

Expect to establish later: Spokane, Wash.; Shreveport, La. (grades 7-8); Utica, N. Y.; Erie, Pa. (grades 7-9).

"The annual reports of the superintendents of Minnesota high schools for June, 1915, show that twenty-seven schools have entered upon some form of organization other than the well established plan of eight elementary- and four high-school years. Twelve of these schools are following the six-three-three plan; twelve, the six-two-four plan; and three, the six-six plan. This year about twenty additional schools are undertaking one or another of these plans of reorganization." (Phillips, E. M., and Barnes, C. H. The junior high school problem. *Bull.* No. 59, 1916. Minn. Dept. of Educ., St. Paul.)

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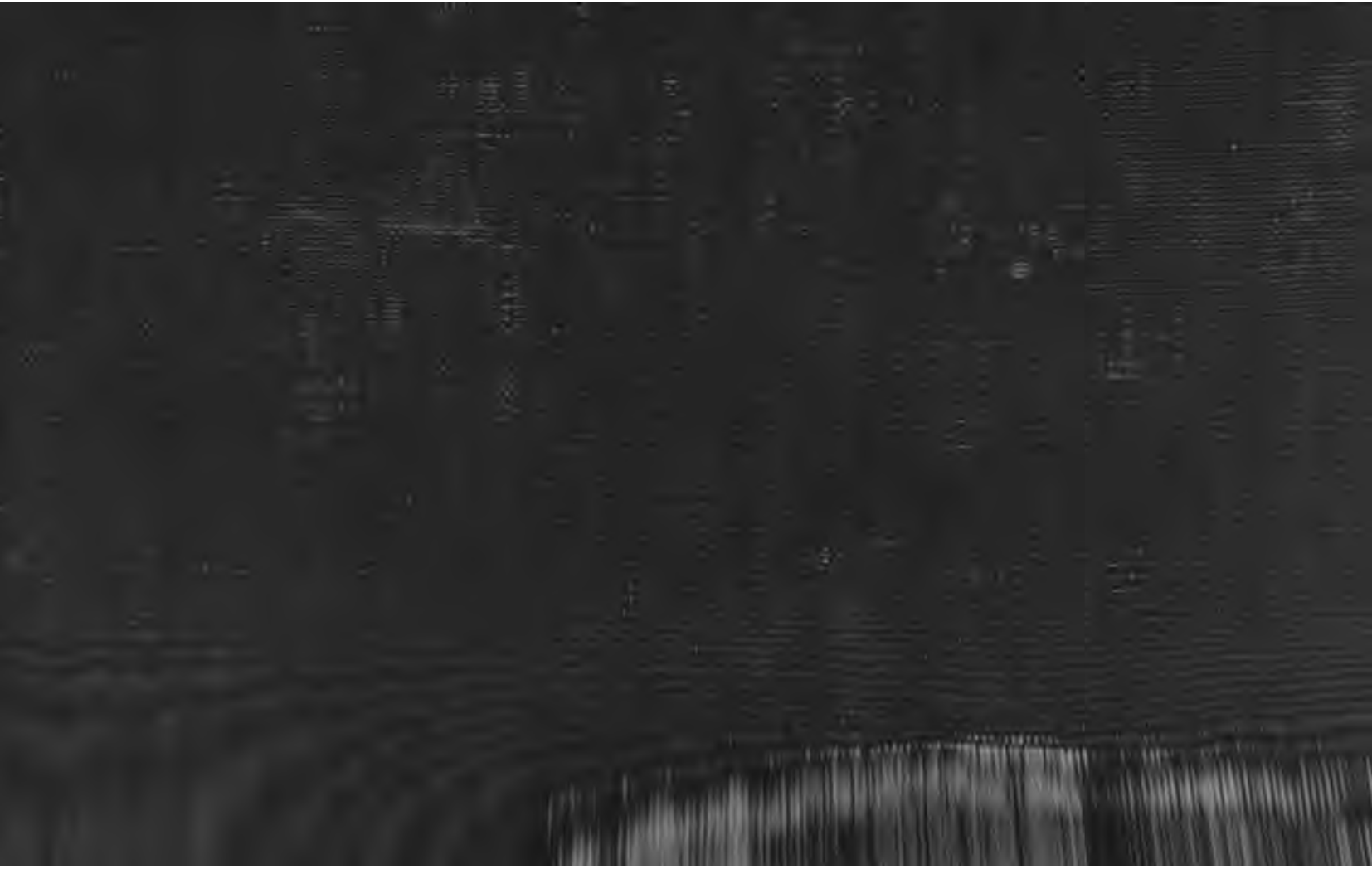
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